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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL 12

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No 1

BRIEF HISTORY OF ORGANIZED MEDICINE*

FREDERIC L. SONDERMAN

President, Medical Society of the State of New York

The Assyrians and Babylonians are generally quoted as the first cultivators of medicine since the dawn of history, followed later by the Egyptians and Greeks. Though it is admitted that the records of Hindu medicine can be traced back as far as any, the claims of the Hindus to be the most ancient civilized people were thought to be based on tradition rather than fact. In recent times, however, the diligent work of Indian Sanscrit scholars has done much to confirm the high antiquity of Indo Aryan civilization.

While medicine of that time was in the hands of priests, and the sick were supposedly healed by the gods and demigods, the cult kept this knowledge in their own craft and were governed by a code of ethics. Thus organized medicine such as it was, came into being several thousand years before the birth of Christ. The oath of the Hindu physician is another evidence of this early organization. Chinese medicine probably antedated all the rest but no evidence of this or of organization is at hand.

Dana in his *Peaks of Medical History* as well as other writers on the subject, claims that the Greeks were the real founders of this science and that Aesculapius was associated with its early development. He is supposed to have lived 1200 B. C. The priesthood concerned claimed to be his lineal descendants, they were the only physicians and care-

* Presented before The New York Academy of Medicine at its Annual Meeting, January 2, 1936

fully kept in their order the secrets transmitted to them which is but another evidence of organization

Herodotus, the father of history, said in the 5th century before Christ, that in Babylon the sick were assembled in the market place to take their choice of the various cures available there. There is, however, no record that this competitive bidding was limited to a sect or that organization among them existed. The era of Hippocrates soon followed, and the framing of the Hippocratic Oath can be accepted as renewed evidence of organization.

While the sway for centuries of this master mind, noted for power of observation, empiricism, practicability, warm heartedness and intellect free from hypothetical assumption, would justify the belief that his ethical influence continued the organization of medicine indefinitely, his influence on medicine itself was in some ways superceded by Aristotle soon after and, to a greater extent, by the Greek Galen in Rome two centuries later.

While it is interesting to note the evidences of organization in medicine in these earliest times, it seems quite impossible to trace them through what has been called the "Age of Coma," dating from the death of Galen to the time of Roger Bacon in the 13th century, a period of nearly 1500 years. Since the teachings of Hippocrates and Galen apparently controlled the thinking of the medical world for 15 centuries, it seems reasonable to suppose that the ethical precepts of organized medicine of that day endured, though but little if any evidence of this is at hand. Such unbounded sway of the individual was never known except in religion and science. In politics the gradual evolution of nations and mankind was never governed by such individual influence, but instead made such men as Alexander, Caesar, and Napoleon while in science single men made history.

This does not mean that prominent and successful men in medicine as well as influential schools such as Salerno and Monte Cassino did not exist during the so called "Age of Coma," nevertheless, ethically at least, Hippocrates held

sway for those centuries and no other evidence of organized medicine was found, despite the fact that Bacon and Paracelsus the Swiss, whose actual name was Hohenheim, cast off the spell of Galen. The following century or two, also replete with the vicissitudes of still uncertain medical progress, show nothing that interests us in relation to organized medicine. The many statements one reads of ridiculous procedures of early medicine remind me of our optimistic historian, James J. Walsh, who claims that such reflections as to the status of medicine at any particular time are based on popular medical superstitions or fads just as if Eddyism, Dowieism or patent medicine claims of the day were taken to reflect the present status.

The next evidence of definite organization in medicine is found in the various medical guilds of England and Scotland. These local companies were quite numerous and a study of them and their activities is a fascinating one, but not within the scope of this communication. Dr. Kaisner of Cleveland has made such a study and also has a large collection of their coats of arms.

In distinction to the College of Physicians and the College of Surgeons with their restricted types of practice, the Apothecaries Guilds included the large mass of general practitioners, and it was in their ranks that the current conception of what is known as organized medicine was found. The term Apothecary is somewhat confusing in this connection and is explained by Barrett as follows: "The conclusion to which one seems bound to come with regard to the position of the early Apothecary is this namely, that originally, in the days when he was incorporated with the grocer, he sold in his shop what drugs he could get. Later, he sold drugs as does the chemist of the present day but the chemist did not then dispense—this was the province of the Apothecary. Later again, the Apothecary both prescribed and dispensed, and finally became what he now is, the fully qualified and licensed general practitioner."

The most prominent organization of this kind and one which exists to the present day is the Worshipful Society of

Apothecaries of London. A history of the same was written by C. R. B. Barrett in 1905—a beautiful delightfully illustrated and interesting book for the student. He states, for example, that the earliest mention of an Apothecary of London was of one Gangeland, who in 1345 received a pension of six pence per diem for life for attending on King Edward 3rd while lying sick in Scotland. While the College of Physicians was formed in 1518, the Barber Surgeons in 1540, and the Apothecaries were joined with the Grocers in 1606, it was on December 6, 1617, that the Society of the Art and Mystery of the Apothecaries of the City of London was chartered. In perusing Barrett's work it is apparent that the society was active throughout its existence in considering the problems generally assigned to organized medicine. Avoidance of sorceries, witchcraft and other inconveniences, later on the qualification for licensure and prosecution of unlicensed practitioners, thus the unincorporated practitioners were the forerunners of the incorporated Apothecary of the first Stuart King of England. Further, the prosecution of sellers of quack nostrums and of mere and impure drugs, the framing of just laws to govern the practice of physic, and codes for governing the ethical conduct of members, were then concern. In fact, the duties and obligations of the society are varied indeed, as shown in the charter, a twenty-page document of some ten thousand words.

In 1815 decided medical reforms were established by Parliament at the suggestion of the Society in agreement with the Royal College of Physicians, and this new Act was broadened to include a much greater area than London alone. Some thirty years later, objection was made to the name Apothecary which had little reference to his actual duties, that he is in fact the medical attendant on the larger mass of the community and should be designated as a General Practitioner of Medicine.

The College of Physicians which later became the Royal College of Physicians pre-existed the Society of Apothecaries as previously stated. An early history of the College

published by William Munk in 1684 indicates that its earliest function was "To restrain and suppress the excessive number of such as daily profess themselves learned and profound practisers in the faculty of Physick, whereas in truth they are men, illiterate and unexperienced, rather propounding unto themselves their private gain with the detriment of this Kingdom, than to give relief in time of need." While primarily active in this effort to rid the profession of undesirables and in the framing of laws for the same purpose, in later time the college gradually left these problems of organized medicine to the larger and more democratic medical bodies, devoting itself chiefly to the science of medicine and the problems of medical education. The College was and still is composed of a scientifically advanced, serious group of consulting and hospital internists and teachers. Fellowship in the College is a high honor not lightly granted.

While searching the Academy library for the books from which this very brief outline has been written, a choice little volume on the history of the College Club of the Royal College of Physicians was found. Though not in the least relevant to the subject under consideration, a brief reference could not be resisted. The College Club began in 1764 and consists of a most exclusive group of Fellows of the Royal College of Physicians, never more than from 14 to 22 in number. In all, the club had 155 members in 150 years. A feature of attraction to us is that that sterling friend of America, and close personal friend of many of us, Sir William Osler, was a member from November 1904 until he died. The activities of the club were limited to a number of dinners each year noted for brilliant wit and good fellowship. A betting book was maintained—the proceeds, accruing to the Club, usually consisted of a haunch of venison or turtle for the Club. The details of menus and wine cards of over one hundred years ago evince the epicure and connoisseur. At one time Thomas Mayo, president of the Royal College of Physicians, and Caesar Hawkins, president of the Royal College of Surgeons, both were married for the second time and gave rise to the following

EPIGRAM ON THE TWO PRESIDENTS

Two learned men resolved of late
 On changing their conditions
 This one of Surgeons President
 And that one of Physicians
 The M D gently urged his suit
 In fear to touch a wrong cold
 The Surgeon like his ancestor,
 Just came and saw, and conquered
 Oh! May good fortune ever crown
 The M D's osculations,
 And Caesar find success attend
 Caesarean operations

Let me now turn from the old world to the new. Here we find today the largest, inherently harmonious group of medical men in the world, about 100 000 in number, banded together in the democratic fashion and constituting the origin of the profession—the American Medical Association. The history of its origin and subsequent development is replete with interest but in a survey of this kind only the most skeleton outline can be sketched. From the beginning and up to 1855 the two books of Nathan S. Davis are the most convenient sources of information available. These are his *History of Medical Education in 1851*, and his *History of the American Medical Association to January 1855*.

Davis divides his record into three periods. The first or colonial period from the first settlement of the colonies to the termination of the Revolutionary War the second from then to the year 1806 when the profession in the State of New York was organized into societies by legal enactment and the third from then to the date of his publication in 1855. This brings us into relatively modern time about which much information is available.

BRIEF HISTORY OF ORGANIZED MEDICINE

We are told that Dr. Samuel Fuller, a regularly educated physician accompanied the first emigrants who landed in Plymouth in 1620. But, even in 1753 it was said that New York with a population of ten thousand had forty doctors, most of whom were pretenders to a profession of which they were entirely ignorant. Further that in New England the greater number of those who practiced medicine were priests whose medical knowledge was chiefly derived from the writings of Hippocrates and Galen. But during the latter part of the first half of the eighteenth century conditions were decidedly improved by promising young men from the New World going to Britain and the Continent for thorough medical instruction. The Anglo-French wars in America with resultant expeditions from the home countries brought well appointed medical staffs which also established hospitals to which non-combatants evidently also had access. It is stated that these wars materially improved the condition of medicine in the State of New York.

It was in 1760 that the General Assembly of New York ordained that "no person whatsoever should practice as physician or surgeon in the City of New York before he shall have been examined in physic and surgery, and approved of and admitted by one of His Majesty's Council, the Judges of the Supreme Court, the King's Attorney General and the Mayor of the City of New York."

Although private and temporary hospitals were also established, it was in 1752 that the first permanent institution was founded in Philadelphia, aided by a grant of £2,000 from the Colonial Assembly. Its superintendent, Dr. Thomas Bond, became the first Clinical Lecturer in Medicine in America. On this foundation the first medical school in America was established in Philadelphia about 1765. New York was not idle and in a spirit of rivalry secured a charter from the Colonial Government in 1767 for the Society of the Medical and Surgical Arts. The medical school in New York was organized in 1771. The medical school in New York came into being in 1771.

While there are no evidences to indicate that any organization in medicine in the modern sense, existed in the earliest years, the first effort in this direction was made in New Jersey in 1766. A well attended meeting resolved in favor of "Mutual improvement, the advancement of the profession, the promotion of the public good, and the cultivation of harmony and friendship among the brethren." This is the first record found of an attempt at such organization.

During the Revolutionary struggle which came soon after, all medical education and other advances in medical affairs were held in abeyance. While medical education was resumed in 1778 and grew rapidly both in the number of schools and then attendance, efforts in the direction of organized medicine were not as prompt. The Massachusetts Medical Society was established in 1781, followed by New Hampshire in 1791, to examine and admit candidates and frame codes of ethics. Many other states soon followed. Despite all this, it was generally claimed, "that at the close of the 18th century, the great mass of the profession were alike unsocial and ungoverned by ethical laws without harmony of action or true dignity." This statement is refuted by Walsh who presents no end of evidence of organized medicine prior to then and in fact a fee schedule as of July 1, 1798: Verbal advice \$5. A letter of advice \$10. Curing syphilis \$100. Hernia, Cataract or Lithotomy \$125. Midwifery for difficult cases \$40.

It was not until 1806, however, that the law authorized the legally qualified physicians and surgeons of each county in the State of New York to form themselves into a county society, to make rules for the government of its members and to examine and license all applicants for admission to the profession. A State Society was also provided for, to be composed of one delegate from each County Society. It must be recalled that many physicians of that day learned what they knew from a preceptor and did not attend college at all. Within two years nearly every county in the State had its medical society. Membership in the County Society of his residence was required of each legal practitioner. The

first meeting of the State Society was held in Albany in February 1807, and completed its organization according to law. Many other states soon did the same, and these societies were similarly legalized to confer permission to practice. Such granting of license to practice was in the hands of Boards of Censors, in some instances associated with representatives of the medical colleges. The colleges themselves could also confer license to practice, subject only to registration. While in 1820 only 38 students received their license from the medical colleges of New York State and three times that number were examined by boards of censors, in 1846 the graduates licensed were 246 and those admitted to practice by boards of censors only three.

As time went on it became increasingly apparent to all that medical education in this country was too brief and superficial, and unsuccessful efforts were made in 1839 and subsequently, toward a national convention for the purpose of agreeing on longer terms of instruction, higher standards of education, and the separation of the power to teach from the power to grant license to practice. In 1846, as the result of unusual effort and perseverance on the part of the New York State Medical Society, the first national convention assembled. Its prime object was to be the elevation of the standard of medical education. After much acrimonious discussion, the important resolutions were referred to Committees and rested for a year. In May 1847, the delegates appointed by the societies, colleges, and other medical institutions throughout the several states met in Philadelphia, 250 in all, representing 40 medical societies and 28 colleges in 22 states and the District of Columbia, and thus the American Medical Association came into being, it to have its first meeting in 1848.

At this first meeting of the American Medical Association in 1848 in Baltimore, the principal effort was again the elevation of standards in medical education, with secondary attention to the matter of registration of births and deaths, establishment of codes of ethics, and pleas for pure drug laws. It is interesting to note that a communication from The New York Academy of Medicine, relative to the need

for better medical education, was received with a covering letter from Dr. John Watson, which resolution was in complete harmony with those of the Association. Again in 1852, the Academy sent a resolution to the Association opposing the holding of clinics in medical schools instead of hospitals, again in support of the contention of the Association.

Interesting and instructive as are these early struggles of organized medicine all in favor of better education and better conduct, it would take far too long to present the details. It would also serve little purpose to review step by step, the increasing number of activities of the Association and the reforms in its constitution for the good of the public and the profession. The primary object of the Association as repeatedly stated, in fact, the very reason for its coming into being, was the purpose of elevating the requirements for pre-medical education, raising the standards of medical education and the creation of independent boards of examiners for licensure.

Some days ago, the press reported a speaker as saying "Health insurance was kept out of the Federal social security act by the pressure of the most insidious and unconcilable of all the pressure groups in the country—the organized medical politicians and medical merchants, under the leadership of the inner circle of the American Medical Association." This very sentiment and practically these very words were used first some 87 years ago, and often later, by the representatives of the inferior medical colleges in opposition to the efforts of the American Medical Association for higher standards in medical education. In both these instances, and contrary to their statements, the contending persons were opposed by the completely united forces of organized medicine.

Most of us know the details of the prolonged struggle as the result of which medical education improved. Of the 165 medical colleges existing in the United States in 1901, but 68 approved or grade A schools remain today. The gradually achieved requirements of pre-medical college education, the proper modern medical training and the indepen-

dent board examination for licensure, are indeed victories for organized medicine, which have made the American graduate the equal of any

Much more might be said of the achievements of the American Medical Association and its constituent State and County Societies constituting organized medicine but let me briefly outline the plant created for the coordination of all efforts and the dissemination of scientific and economic knowledge and data. The House of Delegates consisting of proportionate representatives from each state, determines the policies of the Association. The Trustees administer its affairs. Its work is done largely by councils and bureaus, and its information goes out in its various publications. The Council on Medical Education and Hospitals acquires information concerning all medical schools and hospitals and rates them accordingly. This information is available to all. Of the 6,896 hospitals with 802,065 beds, there are 294 institutions which are not approved on account of criminal practices, unqualified physicians and flagrant advertising. The Biographical Department has for the last 20 years compiled complete records of every physician in the United States and Canada. If you doubt its accuracy and detail, ask to see your own file when next you are in Chicago. At the time of the World War some 40,000 doctors were needed for service quickly and these records helped materially in grading them. The Council on Pharmacy and Chemistry with its Chemical Laboratory and four full time chemists, offers protection in the selection of proprietary remedies. The Bureau of Investigation is the clearing house of information on merit patent medicines, all forms of quackery, medical fads and fakes. It will supply such information to you or your patients. The functions of the Council on Physical Therapy, Committee on Foods, Bureau of Health and Public Instruction, Library and Reference Library Service, Bureau of Legal Medicine and Legislation and the Bureau of Scientific and Educational Exhibits, are evident in their names. The Bureau of Medical Economics studies all phases of this subject, which information is available to all. Its policies the same as

those of all other bureaus and councils are subject to the wisdom of the House of Delegates. The Publishing Department is an extensive one and its activity can be measured in its use of some 60 tons of paper weekly. The staff in the headquarters building numbers about 400. The income of the Association to cover the expense of these various activities amounts to about \$1,250,000 a year, approximately half of which comes from the dues of the Fellows.

It is the duty of every licensed physician to belong to the Association, to enjoy its privileges and to be subject to its discipline. It is the duty of every Fellow of the Association to take an active interest in its affairs, so that it may truly represent all and be representative of all. Care in the selection of your County Society delegates to the State Society is the first step. They elect your State Society officers and the delegates to the parent organization. These in turn elect the officers of the American Medical Association and shape its policies. Thus, the opinion of organized medicine is the consensus of opinion of its members, and it will continue a good opinion as long as each member does his duty.

The exigencies of modern social unrest and the recent economic distress of many, have given rise to occasional "borings from within." While these are no menace in the final analysis, they are likely to give the impression of lack of solidarity and are thus more misleading than dangerous. Organized medicine should have the confidence and respect of all thinking people, and harmony in sober and straight thinking is desirable for this purpose.

Many groups of medical intellectuals have formed strong local societies in the course of the years, which command the greatest respect not only of the profession but of the community and state as well. Of these, The New York Academy of Medicine and the College of Physicians of Philadelphia are outstanding examples. A history of their origin, their development and their beneficent functions is well worth the study, for it shows how self-sacrificing physicians have labored to help their professional brethren, and through them the public at large. While the dissemina-

tion of knowledge by word of mouth, discussion and demonstration as well as by library facilities, has for years been their chief function, their activities also extended to public forums, and particularly to the investigation of current medical education and public health relations, followed by suggestions for improvement

The New York Academy of Medicine particularly, is outstanding in its enterprise for the betterment of conditions. Just as in 1848 and 1852 it aided materially in shaping opinion in the interest of better medical education as previously detailed, so now its painstaking investigations of abuses in Workman's Compensation practice, directly brought about a law of correction by means of which organized medicine disciplines its own members. The latter is but a single example of its recent manifold achievements

It is in the interest of the common good that the closest cooperation and harmony must exist between such academies and the local units of organized medicine, of which ideal relationship The New York Academy and the New York County and State Societies are the best example



THE RELATIONS OF THE ACADEMY TO THE PUBLIC AND TO THE PROFESSION*

EUGENE H POOL

President of The New York Academy of Medicine

A conventional Annual Report is not customary at this time Yet some analysis of present problems seems pertinent Two features especially warrant brief comment—namely, the relationship of the Academy to the Community and the relationship of the Academy to organized medicine

The average layman knows the Academy only as a name That the Academy has its finger on the pulse of many important interests of our community life is known to few It is generally thought of as a meeting place of doctors, perhaps as a beehive of activity, but what those activities are, or whether they touch even remotely the life of the individual or of the City is not common knowledge

It is appropriate, however, that the public be informed as to the part which the Academy takes in the life of the community, and that the citizen should appreciate that the Academy is constantly making considerable contributions towards his welfare

Certain of the Foundations have given generously to make possible the erection of the original building which we now occupy and to provide an endowment to support certain of our activities The generosity of a single individual, matched by the contributions of many of our Fellows and friends (made at a time when the resources of many were sorely depleted) enabled us to build the much needed addition and the Library Extension Our ability to meet expenses with a relatively small deficit is dependent upon annual gifts by four anonymous donors amounting to \$20,000 These generous individuals recognize the value of the work, but the public as a whole has never participated Certainly, there would be a much larger number of benefactors, if the work and the needs of the Academy were more generally recognized

* Presented before The New York Academy of Medicine at its Annual Meeting, January 2, 1936

It must be emphasized, however, that the medical profession bears the major part of the burden. The members of the Academy contribute in dues and initiation fees over \$75,000 a year, in addition to a considerable amount in legacies and gifts.

We can refer only briefly to the constructive efforts and accomplishments of the past year.

Among the high spots of our work during 1935 may be mentioned the following contributions by the Committee on Public Health Relations:

A study of the medical procedures in connection with the Women's Court was undertaken at the request of one of the Magistrates and was presented to a committee appointed by the Mayor to deal with this subject.

As a corollary to this study was that dealing with the control of venereal diseases. In this report was outlined a plan of organization and criteria for the determination of potential infectiousness were formulated for the guidance of the Health Department. Commissioners Parran and Rice heartily endorsed the report.

At the request of the Justices of the Court on Domestic Relations a study was made of the medical factors entering into the work of the Court. A comprehensive study was submitted to the Court and we were assured that it will be of great value in guiding its policies.

Anticipating the requests for views of the Academy with regard to the structure of our City Government in the domain of health and hospital services the Public Health Relations Committee prepared four documents dealing respectively with the organization of the Department of Health, the Department of Hospitals, domiciliary care, and medical services for the prevention and control of illness among City employees. These documents constitute the basis of discussion of the Charter Revision Commission with regard to these problems.

The extensive certification by school medical inspectors for tonsil and adenoid operations has created an over-

whelming demand for facilities in municipal hospitals. At the request of the Commissioner of Hospitals a study of the situation was made with the recommendation that no children be referred without an adequate history indicating the grounds for the recommended operation.

At the request of the Health Department the Committee studied the need and desirability of a convalescent serum center in the City and advised in favor of it.

As in former years the Committee made detailed studies of the City Budget in so far as it relates to the departments in which the Academy is interested.

An inquiry was made into the possibility of protecting hospitals against non-sterile surgical catgut.

Among other things the Committee considered the need for a modern hospital for chronic diseases, research in the Department of Hospitals, the question of the control of potentially harmful drugs and cosmetics, health centers, industrial hygiene, the value of continuing Grade A milk, and morbidity statistics.

During the past year, the Medical Information Bureau received and handled a total of 4,056 inquiries. This is an increase of 29 per cent, or 906 inquiries, over the year 1934.

Eight hundred and thirty-seven inquiries (approximately 21 per cent of the total) were received from the press. Practically every newspaper in Greater New York has made use of the Bureau as a source of medical information, for review of medical news items received by them from other sources, for feature material and for advice on advertisements of a medical nature.

In addition the Bureau was frequently called on to block the spread of false and misleading medical news. In this direction, the Bureau issued "corrective" releases, or statements, on several cancer cures, a specific tuberculosis remedy, misinformation on the thyroid, paternity tests, corneal transplantation and infantile paralysis sera and vaccines.

Three hundred and thirteen daily health columns were issued to the Associated Press. These were published in approximately four hundred newspapers throughout the country.

Forty-four medical releases were issued on important medical subjects.

The Bureau assisted a number of public health organizations in promoting their educational activities. Notable among these were The National Tuberculosis Association, The American Nurses Association, American Public Health Association, American Society for the Control of Cancer and the New York Social Work Publicity Council.

It scheduled and arranged for the delivery of four hundred and six radio addresses, which were given over the major stations in New York City.

The Fellows of the Academy deliver weekly radio addresses on timely medical subjects which reach practically every part of the country.

A series of lectures has been organized, specifically addressed to the lay public. These Lectures to the Laity on the Art and Romance of Medicine are noteworthy in the fact that they do not deal with disease, disease prevention, or even hygiene, but are devoted to the art and romance of medicine, how medicine achieved its goals and how it is striving for those still unattained.

It must be clearly understood that many of the activities of the Medical Information Bureau have been cooperative efforts with other organizations.

Such then is an outline of the Academy's efforts on behalf of the public.

Let me remind you of Ruskin's statement: "We are glad enough, indeed, to make our profit of science, we snap up anything in the way of a scientific bone that has meat on it eagerly enough; but if the scientific man comes for a bone or a crust to us that is another story. What have we publicly done for science?"

There have been other educational activities pertaining to the profession which, however, have been of value indirectly to the Community in that they tend to make better doctors and therefore improve the care of the sick and add to the knowledge of disease. They comprise The Annual Graduate Fortnight with an enrollment of over 600 physicians. Each year there is selected a subject of outstanding importance in the practice of medicine and surgery. The subject in its various aspects is presented in evening lectures, coordinated hospital clinics and in an exhibit.

A series of Afternoon Lectures, with an average attendance of over 200 presenting the recent advances in medicine which are of special interest to the practitioner.

The Bureau of Clinical Information, where detailed information is available regarding post-graduate medical study in the United States and foreign countries. The Bureau publishes a daily Bulletin which announces the meetings, lectures, clinical conferences, hospital rounds and other medical activities of the day. It also publishes a daily Surgical Bulletin announcing the programs of operative work in the hospitals of the City.

In addition to organizing and carrying out the above activities the Committee on Medical Education selects the two Alexander Cochran Bowen Scholars, who are given a year of post-graduate medical study abroad.

The Academy not only publishes the Bulletin which reaches the members and the medical libraries of the world, but also a monthly journal, the Health Examiner, which is sent to every registered doctor in the City. Some 13,000 medical men are thus provided gratuitously each month with information as to preventive medicine.

At the beginning of the year the State Legislature passed a bill which revolutionized the Workmen's Compensation Laws. This bill was the result of recommendations made by a joint committee of the Academy and the State Society. The Committee was appointed by the Governor of the State. The bill was planned primarily in the interests of

and for the protection of the injured employee, and to correct the many abuses which the employee and every interested party suffered under the then existing law. In operation the law as enacted gives promise of meeting the indications.

In recording the needs, I must call attention to the fact that the Academy is managed most efficiently and economically. The expenses of every department have been pared down to the lowest statum.

But every department and subdivision needs support not only for expansion but in order to stem an ebb tide in their activities.

Maintenance must be more generously met to prevent deterioration of the plant. The major part of the work is accomplished through Committees on which are enrolled 213 of the Fellows. Attention has been called to the work of those committees which have to do with questions affecting the public and the profession. These activities are made possible by reason of the fact that the Academy has a large staff of expert and trained investigators and clerks. The ever increasing demands upon the Academy can be met only by an increase in the Staff. Moreover, we must soon face the problem of more equitable remuneration for services. In general, the salaries are still on the reduced scale which the period of depression made mandatory.

The Library must have money and much more money to keep it efficient.

The budget for books this year was \$4,665, including \$610 for rare books, whereas a few years ago the budget for books was \$9,500. While in the past we bought about two thirds of the new books, in recent years we have purchased only one third. We have been woefully falling behind, and obviously it will be difficult to make up the deficiency.

In more prosperous times, \$2,000 was set aside for the completion of files of magazines. For the last year or so there has been only \$200 for this purpose.

Attention may be called to the fact that the Library is the second largest medical collection in the country. Its use is primarily for the advancement of scientific medicine. The practitioner and specialist must have it to keep abreast of the times, but far more important is the fact that it is a necessary instrument of practically every research worker in the city, and by many at distant points in the United States as well as a considerable number in other countries. In 1934, the attendance was 51,793. In 1935 it was larger. On one day in October, 260 readers used the Library. I am not urging its support as a matter of civic pride but as a necessary and material attribute for the welfare of the present and the betterment of conditions in the future.

An important event of the year was the arrival of finished copies, beautifully bound, of the *Andreae Vesalii Incones Anatomicae* for which the actual wood-blocks, made for the editions of the *De Fabrica*, 1543 and 1555, have been used again by the Bremer Presse of Munich. In addition to these wood blocks after drawings of Van Calcar, the Latin text, descriptive of the illustrations, has been reprinted. The books are sold by subscription, the proceeds going to the Library Publication Fund through which other publications of a historical nature will be undertaken. The gratitude of the members of the Academy and of all book-lovers is due Dr. Lambert and the Librarian for the completion of this monumental work.

In regard to the Academy's relations with organized medicine I must remind you that a house divided against itself cannot stand. The medical profession must hold together or lose immeasurably. I do not refer to financial emoluments, but to its dignity, its traditional privileges and rights. If the profession is squabbling and interesting itself in petty politics and trivial or imaginary grievances it may expect to be attacked and successfully attacked by individuals, groups and legislatures.

It must be recognized that while we of the profession may wear different coats, have different creeds and varied connections, our motives are one, our ideals are basically

the same, except in the case of a minority of habitual fault finders and selfish individualists

Mutual confidence and the conviction that the other fellow is not less well motivated than ourselves is of fundamental importance. In general I feel that this attitude prevails, and while we have not reached the millennium and must expect controversies and disagreements these should be approached by all in a broad minded compromising spirit

A Committee has been organized this year for the purpose of informing ourselves on matters of general interest to the profession. Especially those pertaining to trends in medical practice. A further purpose is for it to act as a liaison between the Academy and organized medicine. It is not intended that it take an aggressive part but merely consider problems as they arise

The Academy is not directly interested in politics, yet it is ready to assist in emergencies which threaten to affect the profession and its relations to the public. However, it will not initiate action. By reason of its stable and permanent form of organization and a somewhat academic and certainly a conservative attitude, it is frequently called upon to aid the civic and State authorities in solving problems of interest to public health, public education and other non-political questions. Such opportunities it welcomes. It is, however, always disposed to cooperate with organized medicine and looks for reciprocity. Obviously a sharp line of demarcation cannot be drawn between the fields in which the two organizations should function, and the doubtful no man's land or everybody's land should not cause friction

On its various committees are always a quota of acknowledged representatives of organized medicine. The intention is always to have and to allow mutual knowledge of what is going on, also advice as to what action should be taken on every question. If one side seems to over step its mark let us not take it as an affront and cause for friction, but rather look at the bigger problems, the main one being a united harmonious front on the part of all factions

GEORGE DAVID STEWART— MAN AND POET*

BERNARD SACHS

Our fellow member, George David Stewart, was a man of such varied distinctions that it is difficult to decide whether to speak of him as a great surgeon, a most attractive teacher, a man of wonderful executive ability, a great wit, a poet in his own right, a man of deep religious fervor, a great biblical scholar, or to remember that over and above everything else, he was a genial, warm-hearted friend, a lover of mankind, without guile in his own heart and fully obsessed with the ambition to make and see others happy.

Others may speak of him as the surgeon, as the one-time president of the Academy of Medicine, and of the wonderful work he did there in putting the Academy on its present firm foundation. But here, in this more intimate circle, it is my privilege and almost a solemn duty to speak of Stewart the genial companion, the lover of mankind, and the brilliant versifier and poet, whom we shall always recall with sincere delight, and whose absence from our ranks it will be indeed difficult to forget.

Dr Stewart was elected a member of the Charaka Club on February 16, 1921. It was the period when Charles L. Dana, Aipad Geister, Walter B. James and Pilcher were regular in their attendance at our meetings, and the time when the discussions were particularly vivacious, when Joseph Collins was apt to make startling statements, to be countered by either Dana or Peterson, and finally Stewart's trenchant remarks and deep learning would be of use in tipping the scales toward one side or the other and in settling the argument once and for all.

Dr Hartwell recently referred to Dr Stewart's magnetic personality. That is not a mere formal statement. In this

* Read before the Charaka Club, April, 1933.

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case, it embodies an absolute truth. Whenever Stewart was present at any gathering, one felt that he would naturally be the center of interest, and that the entire course of the evening would be controlled by his charming presence.

In no other colleague of ours did a vigorous frame seem to embody so charming and sweet a spirit. The members of the Charaka Club will recall with greatest pleasure the evening of March 29, 1929, and many other evenings when Stewart recited largely from memory, and his memory was astonishingly good, his own verses and sometimes those of others. I find in his verse the best revelation of his own character.

THE ROAD

High road, low road, all roads lead to Rome
But the luring, laughing, beckoning road
Is the road that leads back home

* * *

For all the ways are heavenly ways, and every trail leads home

His whole philosophy of life, his fondness of outdoor sports, his close communion with nature, are well expressed in a verse or two of

THE CHICKING OF THE REEL

* * *

And when I'm crossing Jordan
It shall be my dearest wish
To obtain a heavenly order
Permitting me to fish
There'll be fewer tears, less sighing,
Less reluctance by a deal,
And I'll land with colors flying,
To the chicking of the reel

But nowhere has he revealed his humor and his human feelings so pleasingly, nowhere has he spoken so charmingly of his own philosophy of life as in

A TIRED DOCTOR'S PRAYER

When I, having finished with things below,
Lie out 'neath the sod alone,
Raise no cold monument to me
Of brass or bronze or stone

But plant me beneath a big oak tree,
 With its roots firmly fixed in the sod,
 And its branches pointing every where
 To the throne of the living God

* * *

Plant me out in the open on some fair hill
 And not in a burying ground,
 'T would be hard for me I know to keep still
 With other folk lying around

* * *

Oh God! for a day or two of rest
 Away from all sickness and sin,
 Where soft winds blow the hours out of the West,
 That cool dawns have wafted in

* * *

Yes, plant me beneath a big oak tree
 Wide spread to each wind that blows!
 If there is none to be found, *plant* a young one on me
 I'll have time to wait while it grows

All of us here will surely remember as perhaps most
 significant of all, the deep impression left upon us by that
 lovely poem of his,

DON'T CUT THE STRING

* * *

So I'll take this for my motto,
 Take this simple homely truth,
 It will serve for age and wisdom,
 Be a beacon, too, to youth,
 I'll engrave it on my memory
 In my heart of hearts 'twill cling,
 When the battle's at its fiercest,
 "Be too proud to cut the string"

And when the strife of life is ended,
 When my battle's lost or won,
 And my tattered banner's drooping,
 Gilded by the setting sun,
 May my heart be at its bravest
 And my voice maintain its ring,
 As I bid the grim destroyer
 "Go ahead and cut the string"

So much has been said about Stewart's virtues as an after dinner speaker, that I recall with especial pleasure the wonderful impression he left with every one of us at the inaugural of the present home of the Academy, held at the old Waldorf-Astoria on November 17, 1926. In the presence of the Mayor and other distinguished citizens, it was his dignified, humorous way of presenting the claims of the Academy that won everyone's heart. He had the happy faculty of combining sarcasm and wholesome criticism. But, coming from his lips, his statements were never offensive.

George David Stewart has left our ranks, but as a memory he will remain as long as we ourselves remain.

IN MEMORIAM OF DR CHARLES L DANA

Resolution adopted by the Committee on Public Health
Relations, January 13, 1936

RESOLVED that the Committee on Public Health Relations records with a deep sense of sorrow the death of Dr Charles L. Dana, the founder of the Committee and its Chairman for the first seventeen years of its existence. The wisdom of his judgment, his scientific eminence, his interest in literature and cultural pursuits, combined with his practical idealism, his faith in the ways of democracy and in the value of informed public opinion, and his intellectual independence and detachment laid the foundation for the work of this Committee. His devoted interest in the Academy and the Committee, and his outstanding personality moulded the pattern of our activities and have left an indelible imprint for the guidance of his successors.

RESOLUTION OF THE COUNCIL PASSED
DECEMBER 18, 1935, REGARDING
DR CHARLES L DANA

RESOLVED THAT

The Council of The New York Academy of Medicine desires to record its deep sense of loss in the death of Dr Charles L Dana, a former President of the Academy

Among the many very great services that Dr Dana rendered to the public and the medical profession, the influence which he exerted upon the policies of the Academy was of paramount importance and the work which he did for the Academy was an outstanding contribution

His devotion to our institution was practically co existent with his professional career Very early he recognized that under wise guidance the Academy of Medicine was destined to take a leading position in all those things whereby the medical profession comes in contact with, and serves its community His contributions naturally led to his becoming the President of the Academy, a position which he filled with unusual devotion and success

He served as a member of the Council for term after term Not satisfied with such contributions, he finally conceived the idea of the creation of a Committee on Public Health and became its first Chairman which office he held over a period of twenty years, until his retirement from active work It is well recognized that this Committee under his wise guidance has been an unusually faithful servant to the City of New York, and the credit therefor belongs to Dr Dana

Dr Dana, in whatever capacity, was wise in counsel, constructive in thought and resourceful in effort The Academy is greatly his debtor and the Council thus testifies as to the regard in which he was held

OBITUARY

DR CHARLES LOOMIS DANA

1852 - 1935

Dr Charles Loomis Dana was born in Woodstock, Vermont, March 25, 1852, and died in Harmon, New York, Dec 12, 1935 in his eighty-third year. He was of that fine New England stock that numbered among his ancestors two Governors of the Massachusetts Bay Colony (Simon Bradstreet and Thomas Dudley) and the Rev Seaborn Cotton, and among his cousins near or distant, men like Charles Stanhope Cotton, William Everett, Francis Lee Higginson, Oliver Wendell Holmes, Robert Treat Paine and Charles Sprague Saigent, to mention only a few of the determinants in his élan and career.

He was graduated in 1872 with a B A degree from Dartmouth not far from his home town and then became secretary to Senator Morrill of Vermont for three years during which he lived in Washington, D C. While secretary to the Senator he was attracted to the study of medicine, entering the National Medical College there in 1874, and graduated as M D in 1876. In 1875 he became for a year private secretary to Professor Spencer F Baird, head of the Smithsonian Institute, but resigned in the autumn of 1876 to enter the College of Physicians and Surgeons, New York, from which he obtained his medical degree in the spring of 1877. Then he had two years in Bellevue Hospital under the great Flint and inspiring Janeway. After this he opened an office in West 46th Street and combined some general practice with a year or two of work in the Marine Hospital Service. About this time he made contacts with Drs Seguin, Hammond and Beard who were practically the only neurologists of that period in New York, and Beard turned over to him his summer practice for two seasons. This was the beginning of his devotion to the special field of neurology which occupied the rest of his life. He became an active member of the New York Neurological Society and the American Neurological Association, and in the

course of time was made President of each of these organizations. He wrote many papers on nervous disorders and finally a standard textbook on nervous and mental diseases. From 1902 onward he was Professor of Nervous Diseases in the Cornell University Medical College in New York. His Alma Mater Dartmouth gave him the degree of LL.D. in 1905 and the same degree was given him at the University of Edinburgh in 1927.

In October 1886 he was elected a Fellow of the Academy of Medicine of New York and became its President for the years 1905 and 1906. But aside from the brief period in which he was President of the Academy (two years), he always took an active part in its work and proceedings, especially as a trustee (1906-1934) and in connection with its important Public Health Relations Committee of which he was the indefatigable Chairman for seventeen years (1911-1928). In one of his reports as chairman he described the activities of the Public Health Relations Committee (consisting of thirty members representing all branches of medicine). The matters studied by this Committee included the organization, standards, needs of hospitals and dispensaries, care of the defective and delinquent in children's courts, institutions, etc., uniform federal quarantine, improvement of living and working conditions in the city, protection of the health and nutrition of children, special studies of epidemics, instruction to the laity and those engaged in public health work, and many other activities that have brought the Committee into contact with every variety of health, educational, social and municipal problems.

About 1922 this Committee at the instigation of Dr. Dana and Dr. Salmon appointed a subcommittee on Religion and Medicine which made surveys of religious healing throughout America and Europe with a special study of Lourdes, and compiled a bibliography of psychosomatic relations published by the Columbia University Press. The scope of this sub-committee has recently been increased by including together with religious healing many other fields.

in which the mind has to do with health, such as mental contagions (panics, effects of moving pictures, radio, news paper accounts of crimes, etc), psychotherapy, psychoanalysis in unskilled hands, faith cure, Christian Science, and the like Dr Dana would have welcomed this expansion into a Committee on Emotions and Health, for he was very much alive to the changing conditions in the world, and to the analogies between the body physiologic and the body politic

In his early days of practice the "rest cure" was current therapy, but Dr Dana with others in the same field came to the conclusion that the best rest for anyone is to do something different It was this idea that led to his becoming one of the founders of the Charaka Club, the members of which are physicians with various hobbies, such as general literature, painting, sculpture, etching and the like Among early members were S Weir Mitchell, Sir William Osler, John S Billings, B Sachs, Pearce Bailey, Joseph Collins, Walter James In the seven volumes of transactions of the Charaka Club are various contributions by Dr Dana, as for instance The Medicine of Horace, the Cult of Aesculapius, When Apollo strikes the Lyre, the Costume of the Ancient Greek Physician, and a very fine Sonnet to Chlo Few would have suspected him of a lyric urge, although his lifelong devotion to Horace must have augured at least some danger of contagion

Dr Dana had a keen provocative mind He was an excellent teacher and his pupils admired and esteemed him Dr Kennedy of his staff at Bellevue and Cornell bore witness to this at a testimonial dinner to Dr Dana at the University Club in 1926 when he said "His work there, the devotion which his personality naturally commanded from the young men who eagerly surrounded him, his vision and his power for organization have resulted today in a strong department in Cornell and a unique neurological unit in Bellevue Hospital, where medicine and the poor are both well served under his aegis "

Under a serious and occasionally somewhat austere manner, he hid a warm and generous heart, eager to do his best for the individual and for the cause of humanity. He had too a delightful sense of humor as evidenced by his "Complete Guide to Togo Hill." Dr. Dana was a collector of many things, paintings, prints, books, ceramics, textiles, etc., and Togo Hill which was the name of his summer place at Woodstock, Vermont, was a depository for some of his treasures. Many visitors came to see him in this sanctuary, so a guidebook seemed necessary. Here are a few quotations:

"Painstaking visitors, who should have rubber-soled shoes and a good sense of equilibrium, having driven to the foot of the Hill will take the Cardiopathic Way. Passing a small Buddhavista of the Ming period they rise one foot in ten until they reach the Bungalow and are confronted with Togo, the 500 year-old marble Dog who keeps off the evil spirits by the enchantments of his face. They will note the carved figure of St. Francis of Assisi in the Oaken Shrine, also the Greek theatre."

"They will walk over the Greek Bridge—the only one in America—designed by an expert in ancient arts from the Metropolitan Museum and constructed by two of Woodstock's favorite sons."

"Below the Pailou are the enamelled iron statues of two Chinese scholars, which formerly stood near a Temple of Confucius in Thibet four hundred years ago. The dogs are genuine Ming (A.D. 1400). The marble headposts came from the fence that surrounds the Summer Palace of the Empress of China. The outlook is pure Vermont, but the yellow umbrella is from Coney Island."

And so Dr. Dana was a pure embodiment of all that is best in New England character, straight and direct in thought, quiet and reserved in manner, equal to any emergency, human and compassionate in all his dealings, but with a fund of quiet humor that made him the most genial of friends and companions.

—FREDERICK PETERSON

OBITUARY
WILLIAM PERRY NORTHRUP
1851-1935

At about noon on Wednesday, November 20, 1935, Doctor William Perry Northrup passed away

He had had a long illness from malignant diseases. A year before he died no one would have promised him more than three months of life, but during that year he obtained considerable satisfaction, for his mind was clear and active to the end. Only two months before his death he made a collection of native nuts, and dictated a dissertation on them.

He nearly reached his eighty-fifth birthday. He said that the Northrups did not know how to die, they would become deaf, blind, and dotty, but would keep on living. From these three afflictions, however, Dr. Northrup did not suffer.

Born on a farm at Peterborough, near Syracuse, New York, he graduated from Hamilton College in 1872, and taught Greek at Knox College, Galesburg, Illinois, for four years before coming to New York. He graduated from the College of Physicians and Surgeons in 1878, and entered practice in New York City. He soon became pathologist at the Foundling Hospital, and it was while he was there that I first knew him. He would bring the material, from the autopsies he performed, to his friend Dr. Prudden, and much of it I worked up for him.

He always attributed his wisdom in pediatrics largely to what he learned from Dr. Joseph O'Dwyer, at the Foundling Hospital.

Somewhat later he became an attending physician to the Presbyterian Hospital, and there he entered upon the campaign for fresh air, which, it seems to me, was the outstanding feature of his medical work. He established a roof enclosure on the hospital, and was instrumental in having similar accommodations arranged for children under his care, in their homes.

Many of these cases treated in this manner were those of pneumonia, and one of his attractive articles on pneumonia in children he ended with the following advice on "How to Kill a Baby with Pneumonia" In this, without stating the fact, he narrated what he had observed in the case of a baby whom he saw in consultation "Crib in far corner of the room with a canopy over it Steam kettle, gas stove (leaky tubing), room at 80° F Many gas jets burning Friends in the room, also the pug dog Chest tightly enveloped in waistcoat poultice If child's temperature is 105° F make a poultice thick, hot and tight Blanket the windows and shut the doors If these do not do it, give coal-tar anti-pyretics and wait"

I am sorry to observe that the important work concerning the value of fresh air done by Dr Northrup at this time has been little heeded by the bulk of the profession

In 1891, Dr Northrup reported to the American Pediatric Society, eleven cases of infantile scurvy, the first cases reported in this country

In 1888, he contributed to Scribner's magazine an article on a pilot boat trip entitled "In the Steamers' Track," and to the Christmas number the next year, one on "The Pardon of Ste Anne d'Auray and other Breton Pardons"

When William Watson published his poem "The Woman with the Serpent's Tongue," Dr Northrup produced an excellent parody entitled "The Baby with the Coated Tongue," which has been recently published

When we entered the World War, Dr Northrup offered his services to Dr George Brewer, Presbyterian Hospital Unit Dr Brewer asked, "What have you done to qualify for taking care of soldiers in the field?" Dr Northrup replied, "Baby specialist, but I'll give up *infantry* and take to *adultery*"

Dr Northrup was an excellent amateur photographer For years he had taken photographs of members of his club, and he left to the Club a valuable collection of pictures of the older members

Dr Northrup was interested in the Certified Milk movements and was a member of the New York County Medical Society Milk Commission, as well as the Walker-Gordon Milk Commission, until the time of his death. He frequently visited the Walker Gordon Farm at Plainsboro, where he made many constructive suggestions.

I observed Dr Northrup many years as a lecturer on Pediatrics, and I think it is fair to say that he was altogether the most attractive lecturer at the University and Bellevue Hospital Medical School of his time. He not only attracted all the members of the class who had to attend, but also he always had many students from other classes, as well as outside physicians.

This attraction was due to his ability to express facts in a graphic manner, interspersed with humor. His "Feedings to Fit," and his "Chicken-pox Comes in Crops," are sayings that most of his students could repeat years afterwards.

He was a frequent contributor to medical literature for many years, and was Associate Editor of the American Translation of Nothnagel's System of Medicine, for which he wrote an article on diphtheria, being the only physician outside Germany chosen to contribute to this system.

He belonged to many medical societies, including the Association of American Physicians.

He had been Chairman of this Section of Pediatrics, and President of the American Pediatric Society.

When sixty-five years old he learned to operate an automobile, and when about seventy years old he took up the game of billiards, and became quite proficient, so that he entered some of the tournaments in billiards and pool at the Century Association.

As I was leaving Dr Northrup one day when he was feeling rather depressed and dissatisfied, I said, "If you want to get well you must do what the nurses wish you to do." He replied, "I don't want to get well."

"It is better to get well than to go to hell," I answered. And as I was opening the front door to leave he shouted, "I'll meet you there."

The last year of his life, while he felt that he could not get well, he still obtained a great deal of satisfaction from the attention of his friends, and fulfillment of his desires. For a while he revived his interest in the Greek language. This autumn after the presentation of an enormous dictionary from a friend, he was continually having words looked up for him. When his friend Dr. May died suddenly he was sorry that he couldn't have had an illness that would have elicited the evidence of affection of his friends.

He said one day, "I am interested in doing, you know I have never done it before."

More than a year before his death he made all the arrangements for his funeral. He sent for the clergyman of the church with which he had been identified earlier in his life, and greeted him with "Yours is the Church I stay away from." The clergyman was so impressed with his personality that he expressed a desire to make some brief comments on him.

Dr. Northrup was thus a man of general culture, a good physician, a wonderfully attractive lecturer, and teacher, and a devoted friend.

ROWLAND G. FREEMAN

RECENT ACCESSIONS TO THE LIBRARY

Actualités médico-chirurgicales par les chefs de Clinique de la Faculté de médecine de Marseille 3^e série

Paris, Masson, 1935, 212 p

Association for Research in Nervous and Mental Disease. Sensation: its mechanism and disturbances

Balt., Williams, 1935, 541 p

Berkeley, (Sir) C. & Bonney, V. *A textbook of gynaecological surgery* 3^e ed

London, Cissell, 1935, 863 p

- Buhler, (Frau), C (Malachowski) From birth to maturity
London, Paul, 1935, 237 p
- Cameron, A T Recent advances in endocrinology 2 ed
London, Churchill, 1935, 406 p
- Cameron, A T & Gilmour, C R The biochemistry of medicine 2 ed
London, Churchill, 1935, 518 p
- Chirav, M M, Lardennois, G & Baumann, J Les colites chroniques
Paris, Masson, 1934, 429 p
- Claremont, C A The chemistry of thought
London, Allen, [1935], 259 p
- Clendenning, L Methods of treatment 5 ed
London, Kimpton, 1935, 879 p
- Constantine-Quinn, M Doctor Crippen
London, Duckworth, [1935], 224 p
- Corlett, W T The medicine-man of the American Indian
Springfield, Ill, Thomas, [1935], 369 p
- Davis, G G, Salmonsens, E M & Earlywine, J L The pneumokonioses
(silicosis), bibliography and laws
Chic, Industrial Medicine 1934, 462 p
- Dewey, E Behavior development in infants
N Y, Columbia Univ Press, 1935, 321 p
- Dirac, P A M The principles of quantum mechanics 2 ed
Oxford, Clarendon Press, 1935, 300 p
- Ditmars, R L The reptile book
Garden City, Doubleday, 1935, 471 p
- Dukes, H H The physiology of domestic animals 3 ed
Ithaca, Comstock, 1935, 643 p
- Everyman in health and in sickness, edited by H Roberts
London, Dent, [1935], 739 p
- Field, J A life of one's own
London, Chatto, 1935, 252 p
- Fitz-Gerald, C T, jr The "Albatross," being the biography of Conrad Fitz-
Gerald, 1847-1933
Bristol, Arrowsmith, [1935], 208 p
- de Fourmestraux, I Histoire de la chirurgie française (1790-1920)
Paris, Masson, 1934, 232 p
- Free medical care—socialized medicine Compiled by E C Buehler
N Y, Noble, [1935], 360 p
- Freud, S Autobiography
N Y, Norton, 1935, 153 p
- Friend, G E The schoolboy, a study of his nutrition, physical development
and health
Cambridge [Eng], Heffer, 1935, 128 p
- Garre, C & Borchard, A Lehrbuch der Chirurgie 8 Aufl
Berlin, Vogel, 1935, 789 p
- Ghosh, B N A treatise on hygiene and public health 8 ed
Calcutta, Scientific Pub Co, 1935, 660 p

- Given, D H C A new angle on health
London, Bale, 1935, 160 p
- Guigoire, R Chirurgie de l'oesophage
Paris, Masson, 1935, 178 p
- Giegory, J A B C of the endocrines
Balt, Williams, 1935, 126 p
- Griffiths, H E Injury and incapacity
London, Baillière, 1935, 270 p
- Griffiths, R A study of imagination in early childhood
London, Paul, 1935, 367 p
- Harmann, N B Aids to ophthalmology 8 ed
London, Baillière, 1935, 242 p
- Heggs, F S M The M B, B S finals
London, Churchill, 1935, 95 p
- Henry, G W Essentials of psychopathology
Balt, Wood, 1935, 312 p
- Insuffisance (L') ovarienne et son traitement Par M Aron, G Jeanneney,
G Laroche [et al]
Paris, Expansion Scientifique Française, 1935, 349 p
- Jamieson, E B A companion to manuals of practical anatomy 4 ed
London, Milford, [1935], 661 p
- Jobson, A Via Typica, story of the 39th Divisional Field Ambulances
London, Westminster City Pub Co, 1934, 236 p
- John Gabriel (Sister) Through the patient's eyes
Phil, Lippincott, [1935], 264 p
- Jones, H E The life, growth and disintegration of cells
Glasgow, Smith, [1935], 86 p
- Kassowitz, K E Around a world on fire, exploits and escapes of an
Austrian World War surgeon
[Milwaukee], Gutenberg, [1935], 197 p
- Kerr, D J A Forensic medicine
London, Black, 1935, 311 p
- Kisch, G Die Prager Universität und die Juden, 1348-1848
Mährisch-Ostau, Kittl, 1935, 239 p
- Kraetzer, A F Procedure in examination of the lungs 2 ed
N Y, Oxford Univ Press, [1935], 126 p
- Kuczyński, M H Studies on nutrition
The Hague, Naef, 1935, 64 p
- Kuczyński, R R The measurement of population growth
London, Sidgwick, 1935, 255 p
- Kugelmass, I N Growing superior children
N Y, Appleton, 1935, 568 p
- Kurtzahn, H F Kleine Chirurgie 3 Aufl
Berlin, Urban, 1935, 456 p
- Lawrence, R D The diabetic life 8 ed
London, Churchill, 1934, 224 p

- Lehrbuch der speziellen pathologischen Physiologie, hrsg von E Becher
[et al]
Jena, Fischer, 1935, 474 p
- Lockwood, C D & Wolfer, J A The principles and practice of surgical
nursing 2 ed
N Y, Macmillan, 1935, 371 p
- Loreti, M Alterazioni congenite del tubo digerente
Bologna, Zanichelli, 1934, 187 p
- Lowenfeld, M F J Play in childhood
London, Gollancz, 1935, 345 p
- Lukens, V H God works through medicine
N Y, Revell, [1935], 166 p
- Marshall, C Christine Murrell, M D, her life and her work
London, Williams, [1935], 133 p
- McGraw, M B Growth, a study of Johnny and Jimmy
N Y, Appleton, [1935], 319 p
- McLachlan, N W Noise, a comprehensive survey from every point of view
London, Milford, 1935, 148 p
- McNally, C E Public ill health
London, Gollancz, 1935, 224 p
- Midwifery, by ten teachers under the direction of C White 5 ed
London, Arnold, 1935, 740 p
- Montgomery, R G The white-headed eagle, John McLoughlin
N Y, Macmillan, 1935, 358 p
- Morton, D J The human foot
N Y, Columbia Univ Press, 1935, 244 p
- Nobel, E, Kornfeld, W & Ronald, A Schilddrüsenerkrankungen im
Kindesalter
Wien, Maudrich, 1935, 129 p
- Nosworthy, M D The theory and practice of anaesthesia
London, Hutchinson, [1935], 223 p
- O'Meara, E J I'd live it again
London, Cape, [1935], 324 p
- Pearson, S V The growth and distribution of population
London, Allen, [1935], 448 p
- Pinev, A & Ward, S Clinical atlas of blood diseases 3 ed
London, Churchill, 1935, 109 p
- Potter, P S Pediatric treatment
N Y, Macmillan, 1935, 578 p
- Principles and practice of preventive medicine, edited by C W Hutt and
H H Thomson
London, Methuen, [1935], 2 v
- Schultze, O Atlas und kurzgefasstes Lehrbuch der topographischen und
angewandten Anatomie 4 Aufl
München, Lehmann, 1935, 428 p
- Scott, D H Health and nursing in the home
London, Methuen, [1935], 473 p

- Seth, G & Guthrie, D Speech in childhood
London, Milford, 1935, 224 p
- Shelling, D II The parathyroids in health and in disease
St Louis, Mosby, 1935, 335 p
- Smillie, W G Public health administration in the United States
N Y, Macmillan, 1935, 458 p
- Sokoloff, B F The achievement of happiness
N Y, Simon, 1935, 271 p
- Solomon, C Prescription writing and formulary
Phil, Lippincott, [1935], 351 p
- Squire, A O Sing Sing doctor
Garden City, Doubleday, 1935, 296 p
- Stein, R O Hautkrankheiten und kosmetische Hautleiden
Wien, Springer, 1935, 218 p
- Swann, W F G The architecture of the universe
N Y, Macmillan, 1934, 428 p
- Tannenbaum, S A & Branden, A P M The patient's dilemma
[N Y], Coward-McCann, 1935, 278 p
- Thomson, H C The story of the Middlesex Hospital Medical School
London, Murray, [1935], 182 p
- Treves, (Sir) F Surgical applied anatomy 9 ed
London, Cassell, 1934, 720 p
- Vachuda, J Das Grossgussverfahren in der Zahnprothetik
Leipzig, Meusser, 1935, 289 p
- Vannier, M L & Thompson, B A A textbook of nursing technique 2 ed
Minneapolis, Univ of Minn Press, 1935, 265 p
- Walsh, J J Education of the founding fathers of the Republic
N Y, Fordham Univ Press, 1935, 377 p
- Weese, H Digitals
Leipzig, Thieme, 1936 [1935], 296 p
- White, F W Birth control and its opponents
London, Bale, 1935, 164 p
- Whitfield, F G S & Wood, A H An introduction to comparative zoology
Phil, Blakiston, 1935, 354 p

PROCEEDINGS OF ACADEMY MEETINGS

DECEMBER

STATED MEETINGS

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)

December 5

THE THIRD HARVEY LECTURE The Virus Tumors and the Tumor Problem, Peyton Rous Member the Rockefeller Institute for Medical Research

December 19

I EXECUTIVE SESSION—a Reading of the Minutes b Election of Academy Officers c Election of Benefactor

- II THE EIGHTY NINTH ANNIVERSARY DISCOURSE DELIVERED BY Mr Walter Lippmann on the subject Aspects of a Philosophy of Government in a Sick World

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY—December 3

- I READING OF THE MINUTES
 II PRESENTATION OF CASES—*a* New York University College of Medicine *b* Miscellaneous cases
 III DISCUSSION OF SELECTED CASES

SECTION OF SURGERY—December 6

- I READING OF THE MINUTES
 II PRESENTATION OF CASES—*a* Glomic tumor Two Cases Beverly Chew Smith Discussion Lester Breidenbach Beverly Chew Smith *b* Cases illustrating papers of the evening Maurice C O Shea—2 cases Jerome P Webster *c* Complicated tendon and digital nerve injuries of the hand One case Free tendon graft to flexor tendon of hand John Garlock
 III PAPERS OF THE EVENING—*a* The treatment and results of lacerated tendons and nerves of the hand and forearm Maurice C O Shea Discussion Constantine MacGuire Lester Breidenbach *b* Some observations on the diagnosis and treatment of the more common infections of the hand Philip C Potter Discussion John Hanford John Garlock *c* Some deformities of the hand their prevention and treatment Jerome P Webster Discussion Frederic Bancroft Robert H Kennedy

SECTION OF NEUROLOGY AND PSYCHIATRY—December 10

- I PRESENTATION OF CASES—*a* Otitic hydrocephalus Herman Selinsky Discussion E D Friedman *b* Aneurysm of the internal carotid artery Aaron Bell (by invitation) Discussion I S Wechsler E D Friedman
 II PAPERS OF THE EVENING—*a* Health as a psychic experience Paul Schilder Discussion George Draper A A Brill B Mittelman (by invitation) David Empistato (by invitation) *b* 1 Ovulation and post ovulation headache Samuel Soltz (by invitation) Richard M Brickner (Paper read by Dr Soltz) 2 The use of orally administered ergotamine tartrate amniotin and phenobarbital for the treatment of migraine Henry Alsop Riley Leon A Salmon (by invitation) (Paper read by Dr Riley) Discussion Irving Pardee S Kurzrock Byron Stookey Leo M Davidoff Israel S Wechsler B Mittelman George Gmandes *c* Autooomic facio cephalalgia Richard M Brickner Henry Alsop Riley (Paper read by Dr Brickner) Discussion Byron Stookey Leo M Davidoff

SECTION OF PEDIATRICS—December 12

- I PRESENTATION OF CASE—Congenital valvular obstruction J Sydney Ritter
 II PAPER OF THE EVENING—The constitutional hemolytic anaemias Thomas B Cooley Detroit (by invitation)
 III DISCUSSION by Harry M Greenwald Kenneth R McAlpin Eric Ponder (by invitation) Paul Reznikoff Carl H Smith Margit Freund

SECTION OF OPHTHALMOLOGY—December 16

- INSTRUCTIONAL HOUR 7 00 8 00—John N Evans (by invitation) Perimetry
 SLIT LAMP—Demonstration of Cases 7 30 8 30—Milton L Berliner Girolamo Bonoccalto Gordon M Bruce Wendell I Hughes
 DEMONSTRATION OF METHOD FOR MOUNTING SPECIMENS (Macroscopic and Microscopic) 7 50 8 50—E B Burchell (by invitation)

PROGRAM

- I READING OF THE MINUTES
 II PRESENTATION OF CASES—*a* Chromic acid removal of xanthelasma (5 minutes) A E Davis *b* Epibulbar sarcoma relieved by excision (5 minutes) H H Tyson *c* Reconstruction of orbit following exenteration (5 minutes) I Goldstein

- III PAPERS OF THE EVENING—*a* The concentration of lysozyme in the tears in acute and chronic conjunctivitis (10 minutes), Richard Thompson Edward Gallardo (by invitation) Discussion Conrad Berens *b* The treatment of retino blastoma by the divided or protracted dose principle of γ radiation—a preliminary report Hayes E Martin Algernon B Reese Discussion Ben Witt Key John M Wheeler James Ewing

SECTION OF MEDICINE—December 17

Symposium on Peripheral Vascular Disease

- I PAPERS OF THE EVENING—*a* The surgical treatment of hypertension (25 minutes) George J Heuer Discussion (5 minutes) Irvine H Page *b* The treatment of peripheral vascular disease by means of alternate suction and pressure (25 minutes), Eugene M Landis (by invitation) Discussion (5 minutes), Kristian G Hansson (by invitation) Herbert Conway (by invitation) *c* The treatment of thrombo angitis obliterans by injections of hypertonic salt solution (25 minutes) Samuel Silbert Discussion (5 minutes), George Baehr *d* The use of choline derivatives in the treatment of peripheral vascular disease (20 minutes) Irving S Wright Discussion (5 minutes) Joseph Kovacs (by invitation)

SECTION OF OBSTETRICS AND GYNECOLOGY—December 17

- I CASE REPORTS—*a* Primary carcinoma of the fallopian tube (Lantern slides) (20 minutes), Meyer R Robinson Discussion opened by Howard C Taylor Jr *b* Retro peritoneal 49 pound fibroma uteri (Lantern slides) (15 minutes) Howard E Lindeman Discussion opened by A J Rongy
- II PAPERS OF THE EVENING—*a* The endometrial theory of ectopic gestation (Lantern slides) (20 minutes) Samuel B Schenck (by invitation) Jesse D Frankel (by invitation) Discussion opened by Harvey B Matthews *b* Fetal heart dilatation pulmonary congestion pulmonary edema neonatorum congenital pneumonia (20 minutes) Morris Leff (by invitation) Discussion William E Caldwell Harbeck Halsted Nicholas M Alter Jersey City (by invitation)

SECTION OF GENITO URINARY SURGERY—December 18

- I READING OF THE MINUTES
- II PRESENTATION OF CASES—*a* Report of rupture of rectum and bladder of unusual origin and course Irving Lerman Elizabeth N J (by invitation) *b* Complete atresia of the urethra autopsy specimen and urogram Arthur H Milbert Bayonne N J (by invitation) *c* Diagnosis of a spontaneous rupture of the kidney pelvis by means of intravenous urography John W Rogers
- III PAPERS OF THE EVENING—*a* Renal and ureteral injuries *a* clinical evaluation of the operative and non operative treatment with urographic findings in sixteen cases, W Calhoun Stirling Washington D C (by invitation) *b* Accidents in renal surgery Albert E Goldstein Baltimore (by invitation) Discussion by Augustus Harris Alexander R Stevens Stanley R Woodruff Clarence G Bandler Ralph L Dourmarshlin Howard S Jock

SECTION OF OTOLARYNGOLOGY—December 18

- I READING OF THE MINUTES
- II PAPERS OF THE EVENING—*a* Simple mastoid operation and some functional results Fred William Graef Discussion opened by James Garfield Dwyer *b* The interpretation of clinical tests of hearing acuity Stacy R Guild Baltimore (by invitation) Discussion by Edmund Prince Fowler Marvin F Jones Edmund Prince Fowler Jr (by invitation)

SECTION OF ORTHOPEDIC SURGERY—December 20

- I READING OF THE MINUTES
- II PAPERS OF THE EVENING—*a* Mistakes in diagnosis of bone tumors 1 X Ray Maurice M Pomeranz 2 Biopsy Norman L Higinbotham 3 Surgery Bradley L Coley

AFFILIATED SOCIETIES

NEW YORK PATHOLOGICAL SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE
December 10

THE MIDDLETON GOLDSMITH LECTURE The Biological Effects of Radiation on the Cells Hermann Holthausen Professor of Radiology Hamburg University and Attending Physician St George's Hospital Hamburg Germany

NEW YORK ROENTGEN SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE
December 16

I PRESENTATION OF INTERESTING CASES

II PAPERS OF THE EVENING—*a* Roentgen diagnosis of lesions of the breast Max Ritvo Boston (by invitation) *b* Treatment of carcinoma of the breast Frank E Adair (by invitation)

III DISCUSSION—William Harris Ira Kaplan Maurice Lenz Harriet C McIntosh

NEW YORK PATHOLOGICAL SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE
December 26

I CASE REPORT—Acute fatal hemorrhage from a tuberculous gastric ulcer Kurt E Lande (by invitation)

II PAPERS OF THE EVENING—*a* The Waterhouse Friderichsen syndrome E E Aegerter (by invitation) *b* Concerning the epithelial invasion in the posterior lobe of the hypophysis Alfred Plaut *c* The pituitary gland in anencephaly D Murray Angevine

NEW YORK MEETING OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
UNDER THE AUSPICES OF THE NEW YORK ACADEMY OF MEDICINE

December 18

I Ultrafiltration of the virus of equine encephalomyelitis J H Bauer H R Cox P K Olitsky

II Staphylococcal antihemolysin in osteomyelitis and other staphylococcal infections J E Blair F A Hallman

III Susceptibility of Mouse strains to lung tumor and sarcoma induced by 1,2,5,6-dibenzanthracene C J Lynch

IV Excretion of urea and creatinine in relation to rate of urine flow in the dog J A Shannon

V Further studies on transmissible myelosis of mice W A Barnes J Furth

VI Placental immunity Placental fluid in measles prophylaxis S Karelitz (Introduced by B Schick)

VII Measurement of x ray absorption coefficients in tooth sections F Hollander

VIII Chemical nature of catalase H Tauber I S Kleiner

IX Ionized blood calcium in patients with renal calculi H Pollack M Reiner

DEATHS OF FELLOWS OF THE ACADEMY

ADLER, HERMAN MORRIS, Berkeley, California, A B, Harvard 1897, A M, MD, Columbia, 1901, elected a Fellow of the Academy April 5, 1906, died December 8, 1935 Dr Adler had been professor of psychiatry at the University of California since 1930 He was a Fellow of the American Medical Association and a member of the American Neurological Society, American Psychiatric Association, New England Society of Psychiatry, Association for Research in Nervous and Mental Disease, American Psychopathological Association, Central Neuropsychiatric Association, American Orthopsychiatric Association and the American Association of Pathologists and Bacteriologists Besides his professorship at the University of California,

Dr Adler had been associate professor of psychiatry at the Harvard Medical School, chief of staff of the Boston Psychopathic Hospital, professor of criminology and head of the Department of Social Hygiene and Medical Jurisprudence and Criminology at the College of Medicine, University of Illinois

DANA, CHARLES LOOMIS, 53 West 53rd Street, New York City, A B, Dartmouth, 1872, A M, 1875, LL D, 1905, M D, College of Physicians and Surgeons, 1877, LL D, University of Edinburgh, 1927 Elected a Fellow of the Academy October 7, 1886, died December 12, 1935 Dr Dana was president of The New York Academy of Medicine from 1904-1906, a trustee of the Academy from 1906-1934, chairman of Public Health Relations Committee from 1911-1928 He was a former president of the American Neurological Association Dr Dana had been professor at Cornell University Medical College since 1902 He wrote extensively on neurological subjects and was the author of a standard textbook on neurology and psychiatry

DE GARMO, WILLIAM BURTON, M D, Coral Gables, Florida, graduated in medicine from New York University in 1875, died January 3, 1936 He had been professor of special and clinical surgery at the New York Post Graduate Medical School and Hospital from 1888-1918 and consulting surgeon to that hospital from 1918 until his retirement Dr De Garmo was the earliest elected living Fellow, having been elected to Fellowship December 4, 1879 He was a Fellow of the American College of Surgeons, a Fellow of the American Geographical Society, an Honorable Member of the Virginia State Medical Society and a Member of the New York State Historical Society He was a frequent contributor to medical journals and was the author of a book on abdominal hernia

KATZ, SIEGFRIED ELIAS, M D, 722 West 168th Street, New York City, graduated in medicine from Harvard Medical School in 1929, elected a member of the Academy November 8, 1934, died December 14, 1935 Dr Katz was a member of the State and County Medical Societies, The American Psychiatric Association, Association for Research in Nervous and Mental Disease, American Orthopsychiatric Association, and a Fellow of the American Medical Association He was senior psychiatrist at the Psychiatric Institute and Hospital, and adjunct neurologist at the Neurological Institute

ROBINSON, WM JOSEPH, PH G, M D, 12 Mt Morris Park West, New York City, graduated in pharmacy from Columbia University College of Pharmacy in 1890, and in medicine from New York University in 1893, elected a Fellow of the Academy March 3, 1910, died January 6, 1936 Dr Robinson was a former President of the Medical Board and Chief of the Genito-Urinary and Dermatological Departments of the Bronx Hospital and Dispensary He was also on the Board of the Pharmacy Institute of New York Dr Robinson was a Fellow of the American Medical Association, The Royal Society of Arts (England), a member of the American Society for the Advancement of Science and of the County and State Medical Societies He was a lecturer on chemistry, pharmacology and materia medica and was the author of many books

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ALFRED GROTJAHN, FOUNDER OF SOCIAL HYGIENE*

S MILTON RABSON
New York

The Grotjahns were a family of physicians, whose founder, Heinrich Grotjahn (1794-1872) served as a surgeon with the Hanoverian troops against Napoleon at Waterloo. After the war he accompanied several officers to Göttingen to continue to dress their amputation wounds. At the same time he studied medicine to be graduated in 1818. His skill at amputations in the era before anesthesia brought many to him to be operated upon at his home or in the village in which he lived. They also spared themselves the horrors of "hospital" gangrene then rife in western Europe. Heinrich's son and Alfred's father, Robert Grotjahn, also a physician, had been graduated at Zürich where he met his wife. She died of sarcoma in 1875 when Alfred was six years old. Her husband married her sister the following year.

Robert Grotjahn was a keen student of medicine all his life and a physician much in demand. Unfortunately he was a morphine addict and often sought hospitalization for relief. His second wife, a manic depressive, was frequently in sanatoria. Alfred's childhood was obviously not a happy one. He avoided his father as much as possible, spending long hours in the garden or in the nearby fields. In his auto-

* Read before the Section of Historical and Cultural Medicine, March 13, 1935.

biography, Grotjahn characterized himself as an almost psychopathic child. Because of nocturnal enuresis he was beaten, shut up in the cellar, dashed with cold water, made to wash his bed linen before the servants. What most affected the child were the customary avowals of repentance after a day of punishment. What saved him in such a household was the undoubtedly paranoid tendency that first manifested itself as an unconquerable self-will, later as an obstinate hold on a goal, no matter what. He was schooled in taking a positive position on everything, a position that was usually in opposition to that held by others.

The child was educated in the village private school and at the age of ten was a boarding pupil with the pastor of a neighboring town. The new household was one of genuine piety and a centre of local society. The master was an excellent pedagogue and so strong was the impression he made on young Grotjahn that the latter, in later life, adopted his teacher's preference for black clothes. Hymnal verses and bible excerpts formed the nucleus of study and were learned by heart.

At the gymnasium Grotjahn at first was scarcely a success. He had no normal memory for names and dates, learning only by re-reading, re-writing, working at home from five in the afternoon until before midnight with but an hour's interruption. Grammar was the chief subject and taught *ad nauseam*. Cheating and annoying the teacher were the only means of counter-attack. The understanding of a subject was unimportant. He who made the fewest errors at the weekly Latin and Greek oral quizzes was the best pupil. The same system was employed in history where "Who conquered whom, where and when" was the famous model. As a result Grotjahn wrote his native language in involved Latin form and was later obliged to re-write and simplify his sentences. During the nine years at the gymnasium, among the small number of teachers, two fell ill with tabes and a third was a marked psychopath.

Alcohol and tobacco, because forbidden, were indulged in to excess. Grotjahn was unable and unwilling to follow his

fellows, feeling that he acted as a damper upon their ebullient spirits. He had never met an opponent of alcohol and thought himself a miserable exception. The smallest member of his class, he sought compensation in gymnastics, as well as in swimming and skating in which he was outstandingly proficient.

He had found a friend in the son of the village innkeeper, who with plenty of pocket money bought book after book to which young Grothjahn had access. They were soon interested in the social democratic movement. The innkeeper's son eventually became Prussian finance minister during the early years of the republic. Zola and Hauptmann were among the first to draw Grothjahn's attention to that problem that was his throughout his life and that was with him on his deathbed — "Why must there be rich and poor? Why are there those in want and those that have too much?"

At graduation from the gymnasium in 1890 he thought of studying political economy and engaging in journalism. His sense of inferiority, the difficulties he had had with composition at school but, most of all, his marked lack of skill in speaking kept him from following his inclinations. Only medicine remained. He knew, however, he could not be his father's successor because of his manual inaptitude which would certainly be a handicap in a country doctor. Another factor favored medicine. His pacifistic leanings saw an advantage in having to serve only a short time as a conscript and not as a front-line combatant in wartime. In Greifswald where he began the study of medicine, when he was not in the dissection room, he attended the various clinics, becoming more and more engrossed in his future profession. He was much more interested in what went on in the living than in what he did with microscope or with his dissections or animal experiments.

Robert Koch was then in his heyday. The first inoculation with tuberculin was to take place. Laurels formed the background before which physicians, nurses and patients

in white grouped themselves to hear an oration by the professor in medicine. Selected patients were then inoculated and three "Hoch" for Koch closed the ceremony. Grotjahn remarked that the theatrical thunder of Wilhelm's era had not even spared medicine.

His readings in socialism led him to believe that, for him, Marxian socialism was unsatisfactory. He was never able to completely adopt the principle of the class struggle and the materialistic concept of history. At the end of his first academic year he served a required half year in the army, in which sergeants, amenable to gifts of cigarettes and money, were directly in charge of the youths. An order to stand by under arms on May Day, 1891 first made him aware, he wrote, of the power of the proletariat and of his class consciousness, this despite his cast of socialism. Not only his reading made him dislike a soldier's life, but also his experiences with those prominent vices that could have no better place for their unbridled development than a barracks. A life in common with other men, without normal contact with women, without common intellectual interests, a community held together by force and commands suppressed, he knew, all better desires and developed all that were undesirable.

The following year was spent at Leipzig under His in anatomy and Ludwig in physiology. Ostwald examined him in chemistry and passed him with an "excellent." Because his father objected to Berlin and its certain political distractions, he chose Kiel for his first clinical year. Quincke headed medicine and Esmarch, with Bier as assistant, surgery. Werth in gynecology did the unusual and gave students ample opportunity to examine patients themselves. Grotjahn also attended a course in sociology under Tönnies who was a notoriously poor lecturer. Since Grotjahn and his friend, the innkeeper's son, were the only students to enroll for the course, lectures were soon abandoned, and the three walked and talked their way over the roads outside the city.

In Berlin where he went to complete his studies, Virchow was virtual ruler of the medical faculty as professor of pathological anatomy. Most students paid only for the most essential courses and attended the others without attempting to pay. Such a procedure was impossible at the pathologic institute. Virchow saw to it that all attending his lectures paid for them, although his teaching was poor and augmented by his assistants. His was no disciplinary reason for Virchow retained the major portion of the fees. When enrolling with him for one course, the students were terrorized by the old man into taking all others offered by him.

Influenced by Virchow, the clinicians treated diseases, not patients, neglecting what could not be determined and described microscopically, mechanically or pathologico anatomically. Von Leyden was an outstanding exception, only to be accused of playing the fool. Olshausen was chief of gynecology, the czaristic von Bergmann, reputedly a lover of the cup, headed surgery. Rubner, who had made his name in Munich under Voit and Pettenkofer, was professor of hygiene. Those who, because of their religion, could get no posts elsewhere, had their own clinics and large student following. Among them was Mendel, the neurologist, Lassar in dermatology, Israel, the surgeon and Lewin in syphilology.

In the fall of 1896 Grotjahn began a general practice in Berlin and it is of interest that in his first year he earned a third of his expenses, two thirds the next year and that thereafter there was no deficit. Two years later he published his first book, "Alcoholism, Its nature, action and distribution" which had been written during the first years of sparse practice. In its introduction Grotjahn indicated the method that was to be his in all his works. "To complete in social scientific fashion the picture of alcoholism as presented by medicine and so gain a complete understanding of the evil, an understanding contrary to that of known authors who underestimate social factors, in other words, to enlarge the hygienic portrayal to the social hygienic."

In 1903 he added to the literature with a monograph on "Alcohol and Factory" in which he studied alcoholism during working hours, with a review of methods designed to eradicate such evils. Shortly before this he quit the Social Democratic party, not to ally himself with another political group but, as his diary notes, to assure himself what he thought would be the widest possible intellectual freedom of action in pursuing his scientific goal.

Believing that Luther's role as the greatest German popular tribune had been neglected, and although not religious, Grotjahn published in 1907, a volume in the series "From the world of thought of great minds." Dedicated to showing Luther as poet, translator and emancipator, it was a collection of Luther's writings including portions of the Bible translation with editorial comments. Two years later "A selected Bible" appeared, edited by Grotjahn and his brother, in which from Luther's translation, portions were selected, divided into paragraphs and supplied with appropriate titles. It is obvious his was no Marxian socialism. Over ten thousand copies were sold.

Meanwhile he was busy with his work in sociology and in what he was to found as a distinct branch of medicine, social hygiene. He was one of the founders of the German Sociology Association, taking part in the various seminars. The first monograph to appear, 1902, was on changes in popular nutrition in which comparison was made between the diet of rural populations with its marked local character and that of industrial populations with monetary payments. Soon afterward he established the "Annual Report of Social Hygiene and Demography," becoming increasingly better known in academic circles. Waldeyer, the anatomist, who was dean of the medical faculty that year, 1905, was asked to bring before the faculty the question of qualifying Grotjahn as privat-docent for public health and medical statistics. Rubner, the founder of the study of calories, had never forgiven him for his monograph on nutrition in which Grotjahn pointed out the dangers of

evaluating all data on nutrition, including those on farm produce, in terms of calories, and for his insistence that experimental tendencies in hygiene be broadened by the inclusion of the social viewpoint. Rubner was temporarily able to keep Grotjahn off the faculty but fifteen years later it was Rubner who was obliged to induct Grotjahn as full professor of social hygiene.

A trip to England and the recognition that not industrialization, but its abuses, were responsible for retrogressive changes in populations were stimuli for "Social Hygiene and the Problem of Degeneration" that appeared in 1904.

Grotjahn's attempts to found a science of social hygiene met with opposition from all quarters. Some feared that the unpolitical attitude of the physician in political affairs would be endangered or even infected with the treasonable opinions of those characterized as "those malevolent socialists." Others said that medicine in itself was social enough to render superfluous a specialty of social hygiene. Grotjahn, however, believed that conscious attention to social factors in the scientific expression of medicine and hygiene had to be clearly brought to universal recognition. Social hygiene is, in his own words, "the study of the relationship between the disease alterations of the human body to social conditions, emphasizing that between man and nature there is civilization, that the physico biological point of view in hygiene must be enlarged by social considerations."

Grotjahn proved to be a pathfinder in the field of tuberculosis institutional therapy. In 1907 he suggested a reorientation in the separation of the early tuberculous in small institutionalized homes to lessen the number of sources of infection within the general population. He pointed out the futility of erecting large, almost luxurious sanatoria that aided the individual patient but neglected the masses. He indicated that the decrease in the tuberculosis mortality rate was not the result of the introduction of sanatorium treatment, but was the result of the industrialization of his

country with its increased wealth and the consequent elevated nutritional standards, better dwellings and other hygienic conditions, and he pointed out the lessons to be drawn. This was an introduction to the general problem of public welfare institutions and hospitals. The following year, 1908, he published "The Character of the Hospital and Sanatorium Movement in the Light of Social Hygiene."

The year 1912 was especially fruitful. The first volume of the year was "Social Pathology" which was revised for a third edition in 1923. It was an attempt at a pathology of human diseases from the social viewpoint, taking the disease as the starting point and investigating all relationships between the disease and the most varied of social phenomena. It also portrayed the conditioning of numerous social conditions by definite diseases. A second work of the same year, edited together with Kaup, was a two-volume "Dictionary of Social Hygiene," an exhaustive presentation of the status of everything social hygienic in Germany at that time. The same year saw another victory for Grotjahn. Kaup had been called as assistant professor to Munich to head the division of social hygiene of the Hygienic Institute under Gruber. In Berlin, Rubner had exchanged hygiene for physiology and the new professor of the former science, Flugge, succeeded in obtaining a priv-docentship for Grotjahn with the title of professor. Private practice was still needed to eke out a livelihood. Rubner, who was then in this country, returned to find his opponent a member of the faculty.

Shortly after the outbreak of the war he issued his "Birth Decrease and Birth Regulation in the Light of Individual and Social Hygiene" in which Grotjahn pointed out that birth regulation did not necessarily mean only birth decrease but rather an encouragement of birth factors as well. He thought to accomplish this by securing higher pay for the breadwinner in proportion to the number of children in the family, as well as by taxing the childless and the bachelor for the support of the child-bearers.

Russia's mobilization and attack on East Prussia were, for Grotjahn, a challenge to western Europe and he saw in a possible victory of the Czar a regression in European civilization. Again no one can accuse him of being a Marxian socialist. Acting accordingly, as did most Social Democrats, he volunteered for active service, although he was then ending his forty fifth year. The next day brought news of the violation of Belgium's neutrality. Shaken to the depths by that event, he immediately recalled his active service application, agreeing only to serve the home garrisons. His scepticism as to German war aims and victory never wavered. In the years of passion and turbulence he never lost his head. He refused to sign the now famous declaration of German university professors that salvation for Europe's civilization lay only in the victory of German militarism, calling Wundt and Haeckel, who did sign, sufferers from an acute psychic upset. He felt that Germans had been called upon to save a rotten Austro-Hungarian empire from the consequences of its own decay.

He spent a month in a garrison town as junior physician with rank of sergeant, despite his age and academic standing. He was told that his failure to be commissioned was attributable to the fact that he had not done voluntary training in peacetime. In the midst of a great war with thousands dying each hour, here was comedy. It was obvious he couldn't be left to eat with the men, nor was he entitled to sit at the officers' mess. The German army breathed in relief when Grotjahn declared he preferred eating in his own room. He found time to publish a popular handbook on health in 1916 of which over 60,000 copies were sold.

A few of the notes in his wartime diary

"March, 1916—The Berlin populace appears more mongoloid from week to week. Cheekbones are prominent and the skin, with fat gone, lies in folds."

"October, 1916—Submarine warfare will eventually embitter the Americans. Tirpitz's followers are incorrect in under-estimating America's fearful might."

"April, 1917—Come as it may the world is being democratized Prussian Germany will not escape without a trace "

"May, 1917—Today, substituting for a school physician, examined and vaccinated a few hundred children in an elementary school before they are sent [to the country] What sorrowful wretched beings! When one compares the magnificent school building with the physically, so miserable human material in it, there comes into one's heart, 'How wonderful in our day are the works of man and how miserable man himself '"

"June, 1917—Another of those superfluous air attacks that arouse neutrals, on the "fortress" of London, with hundreds of women and children killed or wounded in horrible fashion Why don't we leave the French with the glory of the Karlsruhe child murders [the French had bombed that German city] What is most depressing is that our people are dulled to such unnecessary cruelties and regard them as self-understood Whoever denounces them is now completely isolated "

"August, 1917—This war is an example of advanced use of force, without a single one of the many contestants having any advantage from it Force as a political weapon is miserably discredited To recognize this, of course, so fearful a war was necessary "

"January, 1918—According to reliable estimates, ten million men have lost their lives thus far in this war Yet just that seems to make the least impression Food shortages and lack of fuel actually work most powerfully with us survivors upon our need for peace This must be recorded because otherwise no one will later any longer believe or even imagine it "

The war's lesson for Germany, according to Grotjahn, should have been a reorientation with her historic task of intensifying her civilization—and rooting it deeply into the structure of the German people That, he thought, was indissolubly linked to a progressive socialization Germany as well as Europe was now freed, so he thought, of its most dangerous absolutism, Prussianism

After his return from his single month's army service, Grotjahn entered the Berlin health department, still retaining his university connections The city elders, because of electoral restrictions, were recruited chiefly from wealthy merchant families and saw to it that social hygiene and public welfare work was not very intensively or extensively carried on Wartime aided them Grotjahn was appointed a member of the group in charge of mass feeding He was soon placed in control of all milk distribution He

continued his municipal work for the year and a half after the war, when he was chief of all public children's hospitals with a total capacity of 8,000. Both during and after the war it was Grotjahn who received and conducted all foreign visitors to Berlin's hospitals and other communal institutions.

Throughout the troubled months from November, 1918 to June, 1919 he continued to work at his desk and in his classroom, interrupting a lecture when bursting shells hit the hygiene institute. The events of those months taught him much about revolution, that cannon, gunfire and the behavior of a few excited psychopaths did not form the essential features, but it was rather the sudden collapse of the existing government order. With such penetrating ideas he recognized that revolutions do not occur in normal times, that the continued persecution of radicals is superfluous.

With Rubner still in opposition, the ministry of education in 1920 appointed Grotjahn full professor of social hygiene at the University of Berlin. At his inauguration Rubner spared no effort to humiliate him. Grotjahn did not attend the faculty meetings for many years in consequence.

Later old animosities died, and, with only two contrary votes, he was elected dean for the academic year, 1927-28. Even faculty meetings brought things of interest to him. At the end of each session he rummaged in the waste basket for items of psychological interest, the haphazard scribbles and sketches that his colleagues penciled and penned during the meeting. His son published some of them, with editorial notes, after his death.

From 1921 to 1923 Grotjahn was a member of the Reichstag, still continuing to teach. His cherished social hygiene suffered but not completely. He found time to write a small volume on the hygiene of woman, popular in character that had an edition of over 20,000. He spoke but seven times during the two years as a parliamentarian, usually to an almost empty house. He played an important part, how-

ever, in the framing and passage of the child welfare laws. Most important of all, he continued to cherish parliamentary democracy. He characterized some of his fellow-members as psychopaths, it is true, but "psychopaths in politics in parliament seats," he wrote, "were less dangerous than on thrones."

Back at his specialty, having withdrawn from all political activities, he devoted himself to a study of human reproduction and eugenics (published in 1926) as well as to his pupils. Many of them became prominent in the various fields of public health and social hygiene activities. In 1929 there appeared in joint authorship with G. Junge "Moderate School Reform: the Practical Suggestions of a Physician and a Teacher." What children did not bring in heredity, they wrote, no school could extract.

The section of hygiene of the League of Nations invited him, in 1927, to establish, with the aid of the Rockefeller Foundation, an international bibliographical centre for public health work in Geneva. The personnel of the section was always far too busy, according to Grotjahn, with preparations for meetings and foreign trips to give him any aid. International jealousies prevented the naming of a well-trained German, his choice, to the directorship. He consoled himself with the recollections of all previous futile attempts to interest the wealthy in his work. He says: "If one objectively surveys great foundations, in the new world as well as in the old, the same picture repeats itself—the founders want something big and new, but the funds that are given so generously go only for those purposes that, in any event, have to be met by public funds. All of this instead of experiments on a grand scale." He felt sure that even if his proposed international archive and information center for social hygiene had been begun it would have eventually been throttled or handicapped by interested manipulators of foundations. An invitation by the Soviet government in 1930 was declined because he did not feel himself equal to the exigencies of the trip.

In the autobiography that appeared after his death, he wrote of books he should like to publish. For 1932 he planned "Desired Goals of Popular Nutrition in the Light of Individual and Social Hygiene." The year 1935 was to see "Attempts at a System of Pleasure and its Relationships to Health and Disease, to Work, Education and Public Life" that was to teach the means of enjoyment without harm. On the program for 1939 was "The Simple Man and his Property, An Attempt at a System of Healthful Living."

He wrote of his work "That need, misery and poverty exist aroused me from childhood on. I have never been able to adjust myself to the idea that that is inevitable. When I lost my childhood faith in perpetual happiness after death, I had to give myself, driven by inner need, to the socialistic belief in a better future earthly state. The greatest part of my life has been devoted to showing the influence of need, misery and poverty on body and soul, on sickness and death. Without the thought of a socialistic ideal of the future I could not have borne that task."

"Physicians as Patients" appeared in 1929. In it he edited, with his own comments, the description of diseases by physicians that suffered from them. One chapter, on cholelithiasis, was unsigned. Only later did I learn that he was writing of himself. He wrote —

"At irregular intervals, beginning with the years just before the war, I suffered recurrent cramp-like pains over the stomach-liver area that were so severe at times as to necessitate morphine injections. Both the gastroenterologist consulted and I made a probable diagnosis of gall stones. In January, 1920, I suddenly became ill with severe abdominal pains, marked jaundice and a slight fever that lasted but two days. A morphine injection brought rest. The acute attack disappeared after a few days. It was repeated three months later in similar fashion.

"True colic is fearful in reality. It is quite different from a severe toothache in that, while less localized, it is linked up with an unbearable sensation of bursting. One is scarcely capable of thought and is tormented by an unceasing compulsion to change position. Tossing about, lying on the abdomen, sitting up, then falling back again did not help and naturally brought no relief. Despite the severe colicky pains and the comforting expectation of receiving the hypodermic injection I found it most unpleasant when a colleague palpated my abdomen with ice-cold hands.

" The severity of an attack was always broken by an injection. Jaundice disappeared within a few days. Dull backaches and the symptoms of a chronic gastric catarrh lingered for weeks and months. I refused internal medication, prescribed, as well as balneotherapy at Carlsbad or Mergentheim that was earnestly recommended, because its efficacy depends on the patient's self-delusion and upon the uncritical sense of etiology of the physician. Beside operation, only the dietetic treatment of the coincidental gastric catarrh can be effective.

"With this therapy or non-therapy, rehabilitation came within a year, during which time the second attack was milder than the first and the third least severe of all. Had I taken a Carlsbad cure or a homeopathic biochemical or some other medication well recommended in theoretical medicine, my recovery would have been attributed to them. In any event, frank therapeutic nihilism helped in my case. I should, however, not talk of healing for the return of the malady is not only not impossible but quite probable, and those colleagues will be right who have voiced the opinion that I had better have let myself be operated upon after the first attack. Still I do not regret having declined operation. I will not alter my stand even should a catastrophe some day drive me to it, when the surgeon will say, 'He should have let himself be operated upon sooner. Now it is too late.' I have, despite everything, at least remained free of attacks up to the present, six years in all, and I will remain so a few years more. I have an impression however that all is not yet right in my abdomen."

Nine years after the last attack of biliary colic in an attempt to determine the protein minimum as well as the digestibility of rye, he avoided meat in his diet and ate a large quantity of rye bread with his meals. In June and July, 1931, Grotjahn was again obliged to take a meat-containing diet. August 18, 1931, after an interim of eleven years, he was seized with biliary colic which recurred daily for two days. With his aversion to medical treatment, although he had been dean of the medical faculty only a short time before, Grotjahn summoned a different physician each time from a public ambulance station, each time informing the doctor that he was under treatment, needing only a hypodermic injection to relieve the attack. Only after the third attack did he declare himself ready to enter a hospital, and he spoke of premonitions of death. He prepared everything with characteristic conscientiousness and exactitude, writes his son, for the eventuality of his not returning.

At the hospital he was seized again, this attack the worst he had ever experienced. He sprang out of bed attempting to jump from the window. Morphine was effective. He repeated what he had said during the attack, that the long expected perforation had taken place and told his son, "The time has now come when I would begin to employ euthanasia. That's why I let you study medicine. Remember what I have always asked of you and now let me die in peace."

The following day he discussed his condition, believing and hoping that the end was at hand. He spoke with shattering calmness of his books, both those planned and those in course of preparation. With complete clarity he diagnosed his condition: cholelithiasis, perforation, peritonitis, ileus. Operation seemed the only way out.

"At my age it won't go very well. They will say it was too late, but I was colic-free for eleven years. See to it that I get complete anesthesia even if my heart is bad. If you wish, have a necropsy performed."

September 2, at operation, behind diffuse old adhesions, a very large biliary abscess was found which extended up under the diaphragm, across the midline to the spleen. The markedly contracted gall bladder was filled with stones. There was a large perforation in the common duct. The wound was partially closed with drainage.

Cardiac stimuli brought on delirium. Groijahn sat up in bed, continually demanding his spectacles, dug beneath the covers as if arranging his papers. He was lecturing to his classes, with a clarity of style, speaking with so facile a choice of words as he never had before.

"If the physiologist says the protein minimum is 60 grams," he cried, "if the pathologist says the protein minimum is 60 grams, it is then the task of the social hygienist to see to it that every man of the German people really gets that minimum." To his son he cried, "We must tear down national frontiers. We'll do it! They belong to another world. Come often, my son, and tell me about it. We'll exchange reports."

Because of the hopelessness of his condition he received no stimulation after that. Pantopon and scopolamin kept him quiet. "His expression is not empty nor is it that of a

sleepers," noted his son at the time, "but it is thoughtful, ruminating, often mobile, as if searching for words. It seems as if his delirium has given way to thoughts and dreams."

Examination a few hours after death revealed, apart from the operative findings, an acute dilatation of both cardiac ventricles.

There are thoughts of death in the last paragraph of his autobiography —

"The melancholic basic pattern of my temperament also furnishes the precious gift that nature has given us melancholics with compensatory care, namely, the gift to await death, as a somewhat unpunctual but yet dependable friend, with that equanimity that speaks to us in the words of my grandfather, Heinrich Grotjahn, that I find written on the inner cover of his last medical diary in that delicate yet firm Biedermeier script of his—

'Each one tries in vain
To solve Life's puzzle
If he wearies brooding,
It solves itself in Death' "



THE DOMESTIC RELATIONS COURT

*Report of the Subcommittee
appointed by*

*The Committee on Public Health Relations of
The New York Academy of Medicine*

This Subcommittee was appointed at the request of representatives of the Domestic Relations Court to consider and appraise critically the medical and psychiatric aspects of its work

The study was extended over a period of several months. The Subcommittee held many meetings, some of which were attended by the Presiding Justice and by other justices of the Domestic Relations Court. Members of the Subcommittee attended Court sessions, listening to the proceedings in the Courtroom and were greatly impressed with the sympathetic understanding of the children's problems, shown by the judges. They also visited the Psychiatric Clinic and reviewed critically a number of clinic records, studied the annual reports of the Clinic and the Court and consulted the reports of various recent investigations dealing with juvenile delinquency.

PART I

DESCRIPTION OF AND COMMENTS ON THE ORGANIZATION, PROCEDURE AND OPERATION OF THE DOMESTIC RELATIONS COURT

The Domestic Relations Court was established in October 1933, by merging the Family Court, hitherto a criminal court, with the Children's Court, formerly a civil court. The act creating it designated the Domestic Relations Court as a "social agency," for the purpose of safeguarding character in children and parents, and preserving, if possible, the homes of those whom it serves.

Section 85, under Title II, Article 3, of the Domestic Relations Court Act, dealing with the conduct of the Children's Court, provides that "The Court in its discretion,

either before, during or after a hearing, may cause any child within its jurisdiction to be examined by a physician duly licensed as such by the State of New York or by a psychologist or psychiatrist appointed or designated for the purpose by the Court," and in addition empowers the Court to order treatment when this appears necessary

Paragraph 33, Title I, Article 2, provides that "each division and part of the Court shall be served by a bureau for the physical, mental and psychiatric examination of children and of petitioners and respondents in family court cases "

Thus the law itself appears to recognize the medical and psychological, as well as social aspects of domestic problems. This is as it should be. The behavior of a child which brings it to the attention of the Children's Court may be indicative of a physical, psychological or social problem and should be regarded as a social symptom. In certain instances the offense itself may be of a most trivial nature, such as pilfering an apple from a fruit stand, and yet an investigation may disclose a long history of social maladjustment and exposure to a most pernicious home atmosphere.

There are other children who come to the attention of the Court, not necessarily because of their own acts, but because of dependency or neglect. These children often must become wards of the Court in order that their welfare and interests may be safeguarded. Proper placement of such children requires careful consideration of many factors other than those related to adequate physical care and a moral atmosphere.

While the judge is empowered to order the examination of individuals who appear before the Court at any center, or by any individual whom he may designate, and clients are frequently sent elsewhere for examination, the greater number are referred to the Clinic attached to the Court.

The present Psychiatric Clinic was originally established in 1917 to serve the Children's Court. It is not equipped to cope with the increased load placed upon it through the

consolidation of the two Courts. The case load still consists principally of children. Because of this, the Subcommittee's study of the Clinic has been approached mainly from the point of view of the relationship of its work to the understanding, prevention and treatment of juvenile delinquency, as well as the extent and quality of the service which the Clinic renders to the individual delinquent and to the Court in its effort to fulfil the purpose for which it was created. The problems which these children present are frequently bound up with the problems in domestic relationships which are brought before this Court, and it is obvious that in making any recommendations with regard to the Clinic, the Court situation must be considered in its entirety, without undue emphasis on any one phase of the problem to the neglect of another.

It is necessary, therefore, to study the Clinic in relation to the setup of the Court procedure as a whole.

*The Court Procedure Position of the Clinic in
Relation to the Court Setup*

A THE CHILDREN'S COURT

1 *Jurisdiction of the Court*

Under the articles of the law defining its jurisdiction and powers the Children's Court is given "exclusive original jurisdiction" within the county in which it functions "to hear and determine all cases or proceedings involving the hearing, trial, parole, probation, remand or commitment of children actually or apparently under the age of 16 years alleged to be (a) delinquent, (b) physically handicapped, (c) material witnesses, (d) mental defectives, (e) neglected."

It has power to appoint guardians over these children and grant orders for the adoption of such children, as well as to determine the rightful custody over children whose custody is subject to controversy.

The Court is also authorized to render judgment and fix punishment, suspend sentence, place on probation or impose

such duties as shall be deemed to be for the best interests of the child, on adults, parents, those acting in loco parentis, or any other adult who may be charged with acts of omission or commission in violation of the laws of the State or the City of New York, short of the grade of a felony, which are alleged to have contributed to the delinquency, neglect or dependency of a child before the Court

In addition the Court is empowered to fix the liability of parents for the support of their children, and it is given authority to punish for misdemeanor or contempt of Court adults who fail to obey the orders of the Court with respect to the welfare of the children for whom they are responsible

2 *The Children's Court Procedure and the Position of the Clinic in Relation to other Departments*

a *How Children Reach the Court*

"The parent or custodian of any child, an official of a child welfare board, any public official charged by law with the care of the poor, the recognized agents of any duly authorized agency, association, society or institution, or any person having knowledge or information of a nature which convinces such person that a child is neglected or delinquent, or that any child, by reason of its condition, environment or its own acts is subject to the jurisdiction of the Children's Court, or any person who has suffered injury through the delinquency of such child or is concerned with its guardianship or adoption, may institute a proceeding respecting such child," in the Children's Court

A person desirous of instituting such a procedure must file a petition with the Court. The Court maintains a bureau with a staff of clerks for the purpose of entering the complaint and filling out the petition for such action or relief with regard to the case which the law may provide. The clerk receiving the complaint may suggest some other adjustment rather than Court procedure in the case in question. The clerk is not empowered, however, to refuse to make out the petition if the complainant insists upon filing it.

In respect to this procedure the Subcommittee desires to point out that a clerk who is not trained in case work procedures, is not competent to act in such a strategically important position as that of an intake official. The Subcommittee suggests that complaints should be heard by a well trained case worker. After an interview with the prospective petitioner, this intake official should in proper cases determine whether or not the situation presents a problem of sufficient importance to require adjudication by the Court. If the problem is not one which appears to require Court action, the intake officer should so advise the interested persons and, when indicated, refer them to other agencies and cooperate with such agencies for an adjustment out of court. It is to be understood, however, that a petition may not be refused against the insistence of the petitioner without referral to the Court. The Subcommittee is of the opinion that if such a procedure were instituted for receiving and investigating complaints, many would be spared an unnecessary appearance before the Court.

In a children's court in one county in the State of New York, where a similar procedure has been recently put into effect, during the year 1934 there were 624 complaints of a delinquency nature made to the intake department, and of these, only 224 required adjudication. (See Annual Report of Monroe County Court, Children's Division, 1934). A similar plan has also been inaugurated in the Family Division of the Domestic Relations Court where it has functioned most satisfactorily.

From 12 to 35 new complaints are received daily at the Manhattan Children's Court, and a petition is filed in almost every case. The person who files the petition may or may not be accompanied by the child in question, depending upon the nature of the complaint. Whenever a child is arrested, either with or without a warrant, the officer who makes the arrest must immediately notify the parents, and if the Court is in session, deliver the child to the Court. If the Court is not in session, the child must be delivered to the Children's Society Shelter or other place of detention.

designated by the Court for the reception of such children, pending the opening of the Court. The arresting officer then files the complaint.

The Domestic Relations Court also receives by transfer from various other courts a certain number of delinquent or neglected children, who, when found to be under sixteen years of age become subject to the jurisdiction of the Children's Division of the Domestic Relations Court.

b Appearance before the Justice

Unless the Court calendar for the day is completely filled, the case is entered thereon. The complainant is instructed to wait with the child in the anteroom of the Court where the cases are called to go before the judge. The petition meanwhile is placed on the desk of the clerk of the Court, next to that of the judge. The petition is handed to the judge by the clerk when the case is called.

Petitioners are called before the judge one by one. The hearings are held privately. Only the Court personnel and parties directly interested in the case under consideration are admitted to the hearing.

If the petitioner has not brought with him the child or the person mentioned in the petition, the judge, upon hearing the complaint, may reject the petition or issue an order for the parties to be brought into Court, on a later date, allowing at least 24 hours for an appearance following the service of a summons.

When the principals in the case are present the judge may settle the question at once or he may defer his judgment pending investigation. He may order that the child be held in custody either at the Children's Society Shelter or in some other child-caring institution, or he may parole him in the custody of his parents or other guardian while the investigation is being made. The investigation, if the child is not referred to the Clinic, takes one week or less, during which time the child may be paroled to his parents. In more serious cases bail is sometimes required when a child is released from custody pending such investigation.

When a case is set down for investigation, it is assigned to a probation officer who is charged with the responsibility of following out general or specific instructions with regard to the investigation, which includes the gathering of social agency reports, the establishing of contacts with social agencies in proper cases and the preparation for the hearing on the date set. At that time all reports on the investigation must be available to the justice to assist him in making a proper disposition of the case.

The Subcommittee is of the opinion that the matter of remand to the Shelter during investigation should not be routinized. There are, of course, instances in which such a remand is desirable, either for the child's own protection or to impress upon him the seriousness of his delinquency. In other cases a remand may be detrimental to the child. In each instance the decision whether or not to remand during investigation should be weighed from the point of view of a therapeutic procedure. In certain instances remand may have a desirable effect not only upon the particular child involved, but also on other children who have been associated with him in some sort of a collective or gang misbehavior against person or property. The Subcommittee is of the opinion that careful consideration should be given in each case to the advisability of remand, pending investigation, and that remand to the Shelter should not be used simply as a matter of convenience and routine.

*c The Routine by which the Psychiatric Clinic
receives its Cases from the Children's Court*

At the time of the first hearing or after learning more about the child, the Court may make use of the Clinic. There is no set rule as to which types of cases shall be referred to the Clinic, which shall be referred elsewhere for examination, or which do not require an examination. Each justice follows his own judgment in the individual case. Sometimes he receives special information which indicates the advisability of referral to the Clinic. One judge may be inclined to ask for clinic examination of children charged with sex delinquency while another may refer truants and

still another only those who are said to be retarded in school. Some of the judges refer a great many cases, others only very few. On the whole, the tendency is to refer to the Psychiatric Clinic all cases in which the misdeeds appear to be of a particularly offensive or serious nature.

Adults who are alleged to be responsible for the delinquency or the neglect of the child involved, as well as adults in the Family Court may be referred to the Clinic for examination and report.

The Subcommittee believes that the judicial functions of the Court would be assisted and expedited if there were a trained intake department to suggest to the Court which of the cases require a clinic report at the time of the first hearing.

No treatment is given in the Clinic except upon the order of the judge after a report on the findings of the examination has been submitted. The clinic physician may recommend that the case be placed on probation and returned to the Clinic for treatment over a period of time pending final disposition. If the judge chooses to follow this recommendation the case may be returned to the Clinic for treatment.

The Subcommittee wishes to emphasize the desirability of closely coordinating any and all treatment plans of the Clinic and the Probation Department. In such instances the probation officer assigned to a case which is under treatment in the Clinic should be regarded as a case worker in the Clinic as well as a probation officer.

B THE FAMILY COURT

By law, the Children's Court and the Family Court have been consolidated, but as a matter of fact, in Manhattan and Brooklyn they are still separated physically. In Manhattan the Children's Court is housed in the building which it has occupied for many years in East 22nd Street, while the Family Court is in an obsolete building on East 57th Street. In the remaining boroughs the two divisions are consolidated.

The judges who sit in the Children's Court also sit in the Family Court since these two Courts constitute the Domestic Relations Court

In Manhattan and Brooklyn it is still possible for a mother and father to appear before the family division of the Court, while their children may be brought into the children's division as delinquents, or suffering from neglect, although their difficulties may be bound up in those of their parents, under the present routine, the same judge does not always see both the parents and their children. That is to say, although the purpose in placing the two Courts under the same jurisdiction was to make it possible to handle such cases as a unit, it is at present not feasible to do so in the large majority of cases. The Court has, however, recognized the need for a greater coordination of the work of the two divisions, and is now experimenting with various procedures designed to overcome this difficulty. When a new Court building in Manhattan, adjoining the Children's Court is provided, and a similar consolidation is effected in Brooklyn, it is hoped that complete coordination may be realized.

The first Family Court was established in 1910 in an effort to separate the cases which pass through that Court from the run of criminal cases which file through the regular Magistrates' Courts. This Court deals mainly with adults. Occasionally, when the nature of a case obviously calls for action for the protection of the children involved in the problems of the adults concerned, the children are also brought to this Court.

The business of the Family Division is chiefly with the settlement of domestic difficulties, particularly those arising out of inability or refusal to support those for whom the party complained against is legally responsible.

Under the act creating the Domestic Relations Court, the judges were empowered to order mental and physical examinations of any of the parties to a proceeding.

To the end that justice may be rendered not only from the legal standpoint, but from the social point of view, the present law also provides that the Court shall cooperate with welfare agencies and that consideration be given to the benefits available through their services in connection with cases in which misfortune, ignorance, sickness and the many other ills which beset these people are at the basis of their difficulties.

The Subcommittee is of the opinion that in the Family Court, as in the Children's Court, complaints and petitions should be received by persons trained in psychiatric social case work, rather than a clerk, and commends the Court for having organized such an intake department in this division. Even such material problems as non-support are at times only an outward manifestation of an underlying conflict of personalities, and may require expert psychiatric study and treatment in the Court Clinic.

Both adults and children may be referred from the Family Division to the Clinic for examination and report. They may also be returned to the Clinic for treatment. As previously stated the Clinic personnel and equipment have not been increased to carry the extra load imposed upon it by the consolidation of the two Courts. Only a minor number, less than 1 per cent of the total number of clients of the Family Division could be examined in the Clinic during the past year.

C THE ORGANIZATION OF THE COURT

The main division of the Domestic Relations Court is in Manhattan. In addition to the Manhattan Court there are four other branches of the Court, one in each borough. As has already been mentioned, the Manhattan and Brooklyn Courts are still divided into two branches, the one caring for the Children's Court service, and the other handling the work with adults in the former Family Court.

Ten justices are now associated with the Court of Domestic Relations. They serve on a rotating basis, sitting for two weeks each in each of the Courts. It is not possible

under this system to establish continuity in connection with the hearings on the cases which appear before the Court. The judge before whom a case is brought, very often does not see the same individual when the report on his case is ready, as another judge may be sitting in the particular Court on the date set for the second hearing. It is possible for the judge to control the situation by remanding the case for a time when he will be sitting in that particular Court again, but this is not always practicable. The Subcommittee understands that with the recent appointment of an additional justice, a method is being worked out to remedy this situation.

Some of the psychiatrists and psychologists of the Clinic likewise function on an itinerant basis. While the major portion of the work is done in the Manhattan Clinic, the staff visits the other Courts at regular intervals where clinic rooms have been provided for them.

D THE PROBATION BUREAU

One hundred and twenty-seven probation officers are employed by the Court. They are attached to the branch of the Court in which they function. They are charged with the duty of making the investigations ordered by the judges and are responsible for the supervision of the cases assigned to them pending the hearing upon completion of these investigations. Each officer is also charged with the supervision of a certain number of cases placed on probation by the judge for a given period of time pending a final disposition of the case, contingent upon various factors, including behavior in the course of the probationary period. About 50 per cent of the cases are so assigned.

The probation officers make home investigations and obtain other pertinent data needed by the psychiatrist in connection with the examinations at the Clinic. They are also used in the place of psychiatric social workers, which the Clinic lacks, for follow-up and adjustment of cases returned for treatment in the Clinic. At the present time the number of probation officers who have had formal training in psychiatric social case work is limited, and there are only

three supervisors. The probation staff should be commended, however, for their efforts to raise the standards of their work. With the present higher civil service requirements with regard to training and experience, a personnel more adequately equipped for the work is becoming available to the Court.

E THE OFFENDERS AND THE NATURE OF THE CHARGES AGAINST THEM

As previously indicated the clientele of the Domestic Relations Court consists of both children and adults of both sexes. In Manhattan and Brooklyn the former are treated in the Children's Court Division, the latter in the Family Division of the Court.

The petitions in the Family Division, as has been stated, are mainly for support. A few are for disorderly conduct and other similar charges.

In the Children's Court the arraignments are classified in four principal groups: (a) delinquency, (b) neglect, (c) material witness, (d) mental defectives, physically handicapped and others. Approximately 60 per cent are arraigned as delinquents and about 30 per cent as neglected children, the rest are distributed in the remaining two groups.

A *delinquent child* is defined as "a child over seven and under sixteen years of age (a) who violates any law of the United States or of this State or any ordinance of the City of New York, or who commits any act, which, if committed by an adult would be an offense punishable otherwise than by death or life imprisonment, (b) who is incorrigible, ungovernable or habitually disobedient and beyond the control of his parents, guardian or other custodian or other lawful authority, (c) who is habitually truant, (d) who, without just cause and without the consent of his parent, guardian or other custodian, deserts his home or place of abode, (e) who engages in any occupation which is in violation of law, (f) who begs or who solicits alms or money in public places, (g) who associates with immoral or vicious

persons, (h) who frequents any place, the maintenance of which is a violation of law, (i) who habitually uses obscene or profane language, or (j) who so deports himself as wilfully to injure or endanger the morals or health of himself or others '.

A *neglected child* is defined as "a child under sixteen years of age (a) who is without proper guardianship, (b) who has been abandoned or deserted by either or by both of its parents or by any other person lawfully charged with its care and custody, (c) whose parent, guardian or person with whom the child lives, by reason of cruelty, mental incapacity, immorality or depravity, is unfit properly to care for such child, (d) whose parent or guardian has been sentenced to imprisonment for crime, (e) who is under unlawful or improper supervision, care, custody or restraint by any person, (f) who wanders about without lawful occupation or restraint, or who is unlawfully kept out of school, (g) whose parent, guardian or custodian neglects or refuses, when able to do so, to provide necessary medical, surgical, institutional or hospital care for such child, (h) who is found in any place, the maintenance of which is in violation of the law, (i) who is in such condition of want or suffering or is under such improper guardianship or control as to injure or endanger the morals or health of himself or others "

A differentiation is made between neglected children and destitute children, the latter being defined as children who, through no neglect on the part of the parent, guardian or custodian, are destitute or homeless, or in a state of want or suffering due to lack of food, clothing, shelter or medical or surgical care.

Disorderly conduct and stealing are the most frequent charges against children arraigned as "delinquents." Other causes for arraignment in order of their usual frequency are ungovernable and wayward, burglary, desertion of home, violation of railroad law, assault, peddling and begging, truancy, unlawful entry, robbery, violation of corporation ordinances, and a number of miscellaneous minor

offenses A number of children as young as 7 years are arraigned on such charges The greatest numbers are in the years from 12 upward with the most at the 15 to the 16 year level in both sexes

Most of the children come from the lower income groups and the underprivileged classes They represent almost all races, nationalities and religions, are both foreign born and native born More than 50 per cent come from so called "broken homes" Few of these children have had the advantage of active participation in the activities of such organizations as the Boy Scouts or Girl Scouts, the various types of Social Settlements, Community Clubs, Sunday Schools, Churches, the "Y's," and other similar agencies emphasizing character building Frequently these children are under the influence of gangs and other demoralizing companionship Many have never had an opportunity to benefit from contact with persons of high ideals and personality, nor the intelligent personal guidance of some older persons who understand them and whom they can respect In most instances, the schools which these children attend are overcrowded and inadequately equipped The classrooms are congested and the individual attention on the part of the teacher which many of these children need, is impossible under the circumstances The curriculum itself is unsuited to the capacities of the majority of them, and the school work does not interest them In some cases there is not a single character building factor to counteract the unfortunate hereditary and environmental influences and to prevent the child from becoming not only a juvenile delinquent, but possibly a hardened criminal at an early age The Subcommittee was interested in the fact that among the juvenile delinquents brought before the Court there is but rarely a youngster who has participated in the club and other activities of the social and religious agencies of the community

The problem of delinquency is particularly acute among New York's Negro population Between 1920 and 1933 there was a 241 per cent increase in the number of Negro

children arraigned in the Children's Court, although there was but a 115 per cent increase in the total Negro population of the city. Porto Ricans, among whom living conditions are especially deplorable, are also giving increasing concern.

The Subcommittee is very doubtful of the advisability of arraigning children as young as seven years on delinquency charges unless the situation is most unusual. It would seem that whatever judicial control is necessary should be exercised through filing a petition against the parent and not the child.

The Subcommittee also recommends that in cases of neglect, dependency, etc., everything possible be done to avoid making the experience destructive to the child's personality, such as unnecessary detention in the Shelter, presence in Court while the case is being heard against the parent on charges of neglect, etc.

F THE PSYCHIATRIC CLINIC

In each of the Courts a small suite of rooms is set aside for the use of the Clinic. Little attention, however, seems to have been given to the planning of the accommodations, and in general they appear poorly suited to the work, the equipment is also meagre.

The staff of the Psychiatric Clinic consists of three psychiatrists and three psychologists, all serving on half time. In addition there is one physician designated as Director of the Physiological Laboratory whose work consists of giving physical examinations to special cases, in addition to laboratory analyses. In the absence of a laboratory at the Court the work is done in his private office. The Clinic is assisted by a number of volunteer social workers, whose services are of only a temporary nature without the supervision of a case work supervisor, and a clerical staff. The annual salary budget is approximately \$22,000.

Clients referred to the Clinic are given a complete physical examination, including a Wassermann test when indi-

cated, as well as the examination of smears for the detection of gonorrhea, and other laboratory tests. They are also examined by the psychiatrist whose examination is concerned with the emotional life of the individual, his habits and his reactions to various environmental influences.

Each client is also examined by the psychologist. The psychological examination includes standardized mental tests to determine general intelligence, aptitudes, abilities and disabilities, as well as personality factors which may have a bearing upon the understanding and adjustment of the individual.

The Clinic is handicapped by having to rely upon relatively incomplete personal family histories, obtained to a great extent through the report of the probation officer in charge of the case. Upon the data obtained from the physical, psychiatric and psychological examinations, a diagnosis and plan for the patient is made. A report is made to the judge for his information when he hears the case on the date of remand.

Should it seem that treatment in the Clinic may benefit the patient, such a recommendation may be made. The judge uses his own discretion with regard to the disposition of the case in the light of all the reports on the investigation which have been ordered. The examination in the Clinic is but one of these and the judge may or may not return the case for treatment in the Clinic. If the case is returned for treatment it is carried for as long as a period as is deemed necessary.

The Clinic staff is also available to the probation officers for consultation with regard to cases which have been placed on probation after examination but not officially returned to the Clinic for continuous observation or treatment. There is here an opportunity for a close working relationship between the Clinic and the probation department.

There are no social workers on the Clinic staff, although as previously stated, there are a few volunteers who do

social work as students in training or in other similar capacities, and the Clinic also makes use of the services of the probation officers who have the particular cases in charge

In 1934, a total of 27,660 new cases were heard in the Courts. Of this number 15,385 were heard in the Family Court (adults) and 12,275 in the Children's Court, of whom 11,339 were children. Of the total of over 15,000 adults, only 166 were referred by the judges to the Clinic for examination, but in the cases of the total of 11,339 children, 1,037, or about 11 per cent were referred to the Clinic. Twice as many boys were referred to the Clinic as girls. Of the total number of 1,037 so referred 881 were charged with delinquency and 156 of the children were in the Court because of neglect by the parents. The average age of the total group was 13½ years. Of this entire group of 1,037 children, 292 were found to be of subnormal mentality as determined by psychological tests, and 27 of superior intelligence. The bulk were the dull normal. A further analysis of the I. Q. in relation to the distribution of these children in the school grades indicates that about one half of the children in regular classes were working beyond capacity.

According to the Clinic classification, 400 of the 1,037 were of "normal tendencies", 216 were mental defectives, 8 were psychotic, 102 of psychopathic personality, 119 with organic types of trouble, 169 neurotic, and 13 obscure*. The great majority of these children had some kind of gross physical defect. However, the defects of the teeth and of nutrition were the most frequent. Twenty seven were venereally infected, and of these, 20 were girls and 7 boys. Of the entire group of children, 257, or one fourth, were Negroes. The Negroes constituted exactly half of the children native born of native born parents. Of the 561 children native born of foreign-born parents, the predominant group, almost one-third, was Italian. Three hundred and ninety-two children were foreign born, and of this group again, a little less than one third were Italians.

* The terminology used is that of the Clinic.

The offenses with which the children were charged in order of their numerical frequency were ungovernability, desertion of home, and stealing. Disorderly conduct was charged in 55 instances, unlawful entry in 46, truancy in 32, assault in 17, robbery in 7, and burglary in 5.

As far as "overt distinctive factors" were ascertained in the social histories of the children examined, they indicate that 292 of the children were orphans, in 208 cases the parents deserted the family or were divorced or separated, 103 of the children had step-parents, 119 were in foster homes, 29 of the children had parents with a prison or court record, the parents of 98 of the children were alcoholics, 21 were psychopathic, 46 psychotic, and 7 feeble minded.

An analysis of the Clinic recommendations as to the disposition of the cases, with those of the Court action, indicates that the recommendations of the Clinic physicians are followed rather closely. The Clinic recommended 522 for probation—actually 20 more were so remanded, 115 were recommended to a protective institution, and 98 were sent, 180 were recommended for a corrective institution and 174 were sent, 116 were recommended to institutions for the feeble minded, and 81 were so disposed of, 3 were recommended for discharge and the judges discharged 58, 21 were recommended for medical treatment and the Court so ordered in 14 cases, 36 were recommended for foster home placement and 32 were so placed. There are various reasons for the divergence between the judges' disposition of the cases and the recommendations made by the Clinic, which in most instances is not great. It is frequently, no doubt, due to the lack of facilities for certain types of delinquent children and changes in the situation which may have occurred after examination in the Clinic. Provision for Negro Protestant children is said to be particularly inadequate.

Of the 166 adults examined in the Clinic, 20 were morons, 36 psychopathic, 28 psychopathic personality, 13 physical

inferiorities, 3 cerebral trauma, 29 neurotics, 3 "obscure", and 34 with "normal tendencies"

During recent months there has been an increase in the number of adult cases referred from the Family Division of the Court for examination and study. This has resulted in a curtailment of the work of the Clinic with children, as the Clinic staff has not been increased proportionately. The facilities of the Children's Department of the Psychiatric Division of Bellevue Hospital are being utilized increasingly for cases which formerly were referred to the Psychiatric Clinic of the Court.

The Chief of Clinic stated that the treatment clinic for adults is not progressing as well as that for children because these patients are more seriously disturbed and will not cooperate sufficiently to attend the Clinic. The average length of time that the cases are under treatment in the Clinic is about one year, although there are a few children still on the active roll who were placed on probation in 1933.

G. RESOURCES AVAILABLE TO THE COURT FOR DISPOSITION OF CASES

In disposing of the cases which appear before the Court either when first heard or upon completion of the investigations which have been ordered, the justices have many other resources in addition to the provision of treatment in the Court Clinic.

It is the judge's privilege to order treatment of any type needed, wherever he may choose to have it given, and the various hospitals and clinics in the city have been utilized for the purpose.

Many cases are placed on probation for a period of time under the guidance of the official probation officers, who are expected to make every effort to change the conditions which are found to have given rise to the difficulties which brought the child or adult into Court.

The services of a number of social welfare agencies are also available, including such organizations as the Big

Brothers and Big Sisters of the three principal religious denominations, various "homes" and shelters, settlement houses recreational centers and others engaged in social case work

A number of cases, 2,000 or more, are committed to various custodial institutions, including corrective, as well as protective Placement in suitable foster homes or with relatives or friends is also frequently resorted to

The problems which the Court is called upon to solve require the utilization and cooperation of a great number and variety of social agencies

As a cooperative agency to act in liaison capacity between the Court, the public, the city officials and the numerous welfare groups whose interests relate them closely to the Court, a Public Relations Committee was recently appointed by the Court Such a committee is in an excellent position to render an inestimable service to all concerned in helping to develop and coordinate the resources necessary to a fulfilment of the purposes for which the Court was created A lack of resources for the adjustment of these cases seems to be one of the greatest problems facing the Court

PART II

SUMMARY

The Subcommittee is of the opinion that the problem facing the Domestic Relations Court is much more than a purely medical one

In dealing with this problem the field of psychiatry has an important contribution to make but it does not offer the complete solution The situation calls for cooperation between all the various social, legal, educational and medical agencies available to remedy the conditions which are chiefly responsible for the startling increase of crime in recent years It is a well established fact that much of this begins in juvenile delinquency or results from conditions brought out in connection with the type of cases which pass

through both divisions of the Domestic Relations Court, and which are in many instances amenable to correction through constructive social case work

Many look upon the Domestic Relations Court as a potential huge psychiatric clinic. It is undoubtedly true that there are among its clients a number of psychotic and feeble minded individuals, as well as many who are chronically ill and unable to work and others who are emotionally disturbed or otherwise inadequate. *Psychiatric implications exist in many of the cases. Nevertheless it does not appear necessary, it is obviously impossible, and it is even not desirable to provide a complete psychiatric examination for every client.* The need, rather, seems to be for more intensive social case work. In view of the most gratifying fact that only rarely are children brought before the Court for delinquency when they have had the benefit of close association with such organizations as the Boy Scouts, Girl Scouts, Settlements of various types, Clubs, Sunday Schools, Churches, the "Y's" and other similar character building organizations, the Big Brothers, Big Sisters and other groups interested in the youth of the community, the Subcommittee recommends an extension and increased use of the services of these organizations in the treatment and prevention of juvenile crime.

All persons interested in welfare work and in the prevention of delinquency, are well aware of the responsibility of parents for the proper development of character in their children. Discipline, well organized family life and acceptable standards of behavior all play their part in helping children to appreciate the desirability of self control and to help them become socially useful members of the community. The fact that such favorable family and community influences are lacking in so many delinquent children should immediately direct our attention to these environmental factors. Not infrequently faulty home and environmental situations are direct expressions of some deviation from the normal in the mental make up or attitude of the adults whom the law regards as capable of assuming parental responsibilities. Some of these devia-

tions are modifiable by treatment while others seem to be fixed

In considering the nature of the cases which appear before the Court and which are examined in the Clinic it has seemed to the Subcommittee that a great deal of time is wasted on the part of both the judges and the psychiatrists in dealing with cases which should not require the time of such highly specialized personnel. Many of the charges involve petty thefts, and other offences which are a direct result of the unfavorable conditions under which these children live and have been brought up. A great majority of the cases are those which a well-trained social worker should be able to handle or which an adequately supervised probation officer would be able to understand and adjust. It is questionable whether such children should be brought before the judges except when legal authority may be required to determine the disposition of the case or to validate the action indicated.

In the vast majority of the cases neither the edicts of the judges nor the diagnoses of the psychiatrists settle problems any better than they could be settled through intelligent and sympathetic guidance and supervision on the part of a person properly trained in social case work.

Moreover, the Clinic is at present seriously handicapped by the absence of proper facilities to carry on its work, and by the failure to provide social workers with psychiatric training to assist both in the preliminary investigations of the cases and in the subsequent treatment of the cases returned to it for the purpose. Standard qualifications for such workers have been formulated and well recognized training centers have been established, making available such training for the personnel of this Court.

There is evidence of lack of coordination between the work of the Clinic and that of other departments and in many instances the findings of the psychiatrist become a matter of record only, never implemented with action. Frequently this is due to lack of facilities not only in the Court itself but in the community as well.

It is evident from an examination of the records that effective psychiatric treatment to bring about the proper adjustment of the case is not always possible under present conditions

The Subcommittee is of the opinion that efforts should be made to secure funds for the development of a psychiatric clinic which will include the provision of suitable quarters and equipment, as well as an adequate personnel

There should be a branch in each of the larger boroughs under the supervision of a competent psychiatrist to render the psychiatric service which may be required for both adults and children who pass through the respective divisions of the Domestic Relations Court. Provision should also be made to utilize the Psychiatric Clinic to better advantage, through a more suitable selection of the cases referred to it and through a better coordination between the services of the Clinic and the services of the other divisions of the Court, as well as those of outside social agencies

A number of trained social workers with a psychiatric background are needed to carry out the work of the Clinic more effectively. Valuable service could be rendered by such workers, not only on the Clinic staff, but in the probation department. Moreover, the probation department should be supervised by a highly trained and experienced social worker with psychiatric training

It seems to the Subcommittee that the present situation calls for the immediate addition of a number of such workers to the staff of the Court in the departments mentioned rather than the addition at this time of more psychiatrists, psychologists, probation officers untrained in psychiatric case work, or other Clinic, probation or clerical personnel

The Subcommittee believes that while the present clerks may be retained to fill out the affidavits or petitions when a complaint is actually filed, the first contact with the clients should be through an intake bureau, staffed with well trained social workers with psychiatric experience and

supervised by a person of adequate background and practical knowledge, having the requisite qualifications as to personality for a successful performance of the duties involved. Were such a system devised, only those cases in which legal questions are involved and others where an appearance before the judge is definitely indicated or demanded, would be arraigned after the filing of a petition. The members of the Subcommittee personally observed that many of the young culprits arraigned did not appear to appreciate the seriousness of having been haled into Court, possibly this is due to the fact that they are brought into Court too often and on unimportant charges, so that the appearance before a judge is not as impressive an event as it should be. It does not seem wise that all of the large group of neglected children who constitute 30 per cent of the case load should be submitted to a Court procedure.

The Subcommittee is also of the opinion that the system whereby the Court and the Clinic professional personnel rotate as at present, is not conducive to a satisfactory continuity of effort. In this connection the Subcommittee looks with favor upon the suggestion that a model Court unit with a stationary staff, including a model psychiatric clinic, might be set up in one of the smaller courts, for the purpose of trying out the setup recommended.

Finally, the Subcommittee is of the opinion that the recent shocking occurrence in which three youthful offenders, one of them 11 years of age, the other two only 13 years, committed murder in a holdup, constitutes a challenge to every socially minded individual and all the social agencies in this city to pool their resources in a concerted and purposeful attack on the conditions which are responsible for such a tragic state of affairs among the underprivileged youth of the community. From five to ten thousand such potential cases pass through the Children's Court annually. Our schools are struggling with many more. They are seen daily in the child guidance clinics throughout the city. One of the boys in question was known as a so called "problem child," and two already had a record in the Children's Court. All three are representative of the

children regularly seen in the Court. Their life histories and social background are typical. The reports on these cases indicate the unwholesome influences at work in the lives of these children, among other things, the effect of motion pictures. Whereas formerly few children knew the meaning of the word "holdup" certain types of films illustrate every technique of crime, and according to the newspaper reports the boys in question stated that they had learned to use a gun for the holdup "in the movies."

Little can be accomplished permanently to adjust such children without a complete change in the method of attack upon the problem. The work of the physician is only one phase of the matter. The recently appointed Public Relations Committee of the Domestic Relations Court offers a medium through which the required coordination of the efforts of all concerned with this problem may be effected. All of the best minds available should be brought together for a series of conferences for the purpose of devising plans whereby the community may meet this challenge.

PART III

RECOMMENDATIONS

The recommendations of the Subcommittee may be stated briefly as follows:

1. A reception or intake bureau should be established in the Children's Division of the Domestic Relations Court to function as a selecting agency in connection with all incoming cases, this bureau to be staffed by experienced social service workers thoroughly trained in the methods of psychiatric social service.

2. Additional trained social workers with psychiatric case work experience should be appointed to the probationary staff and in the Psychiatric Clinic. The Subcommittee recommends the addition of these workers before other additions are made to the existing staff. The qualifications formulated by the New York City Committee on Mental Hygiene might serve as a guide in the selection of this personnel.

3 Opportunity to improve themselves through suitable training should be made available to probation officers now on the staff who may require additional training to enable them more efficiently to perform their duties

4 To be of greater service to the Court, the Clinic should contribute more than diagnostic service and more than a follow up of clients, which has been chiefly confined to records of progress in which the services of the Clinic staff play little part. Provision should be made for the better utilization of the resources of the Clinic in the adjustment of well selected cases which offer promise of results

5 In planning the quarters for the Clinic in the proposed new building, detailed attention should be given to the requirements of an adequate psychiatric service, including the provision of suitable examination rooms and equipment as well as other facilities necessary to the proper functioning of such a unit

6 It is the opinion of the Subcommittee that better work could be done if families were treated as a unit when parents' and children's cases involve one another. In this connection, it is gratifying to note that a substantial effort has already been made to bring about a better coordination of the activities of the two Divisions of the Court

7 The Subcommittee also recommends that the present system whereby both Court and Clinic professional personnel serve the various boroughs on a rotating basis, should be so modified as to make it more conducive to the necessary continuity of effort. Better case work would be possible if a permanent clinic staff were located in each of the larger boroughs of the city

8 The Subcommittee recommends the utilization of one of the smaller Court units for the setting up of a model Court, including a complete Psychiatric Clinic unit, and a carefully selected intake and probation staff, to demonstrate how such a Court should deal with the problems which it must handle

9 The Subcommittee wishes to bring emphatically to the attention of the justices of the Court the danger of overestimating psychiatric indications as a causative factor in juvenile delinquency. Such emphasis may detract from giving due consideration to the gravity of family, environmental and other factors in a given case.

10 It is hoped that the recently formed Committee on Public Relations of the Court may become an effective agency in bringing about a coordination of effort on the part of all community agencies interested in the problem. The Subcommittee recommends the holding of a series of conferences with a view of planning an effective course of action on the part of all concerned. To these conferences should be invited leaders in the fields of law, education, medicine, the ministry, public administration, penology, psychiatry, psychology and social work, prominent citizens and representatives of such organization as the Boy Scouts, Girl Scouts, Big Brothers, Big Sisters, the "Y's," the various settlements, Juvenile Club, Church and Sunday School groups, and all other agencies interested in the welfare of the youth of the community.

In conclusion the Subcommittee wishes to go on record as having been deeply and favorably impressed with the work of the Court and offers the above findings and recommendations not in any spirit of criticism but in the hope of upholding and strengthening the constructive efforts of the Court. The Subcommittee desires to express its admiration of the attitude of the justices toward the problem, to commend the marked improvement of the probation service, and the broad-minded and humanitarian point of view of the Court as a whole.

Respectfully submitted,

BERNARD SACHS, M D, *Chairman*

HOWARD W POTTER, M D

HERBERT B WILCOX, M D

E H L CORWIN, Ph D, *Executive Secretary*

October 30, 1935

Approved by the Whole Committee on November 4, 1935

A SELECTED LIST OF NEW PERIODICALS ADDED SINCE MARCH 1935

- Abhandlungen zur Geschichte der Medizin und der Naturwissenschaften
Berlin, no 1, 1934
- Acta psychologica
The Hague, vol 1, no 1, 1935
- Anales de pediatria
Barcelona, vol 1, no 1, Jan 1934
- Anesthesie et analgesie
Paris, vol 1, no 1, Feb 1935
- Annales des fermentations
Paris, vol 1, no 1, May 1935
- Archivos internacionales de la ludatidosis
Montevideo, vol 1, no 1, Dec 1934
- Archivos de medicina interna
Habana, vol 1, no 1, Jan-Feb 1935
- Archivos venezolanos de cardiología y hematología
Caracas, vol 1, no 1, March 1935
- Bulletin de l'Association des médecins de langue française de l'Amérique
du Nord
Montreal, vol 1, no 1, Jan 1935
- Diabetic journal
London, vol 1, no 1, Jan 1935
- Giornale italiano di anestesia e di analgesia
Torino, vol 1, no 2, June 1935
- Interne (Interne council of greater New York)
N Y, vol 1, no 1, Jan 1935
- Journal of the Canadian dental association
Toronto, vol 1, no 1, Jan 1935
- Journal of contraception
N Y, vol 1, no 1, Nov 1935
- Mémoires de l'Académie polonaise des sciences et des lettres Classe de
médecine
Cracovie, vol 1, no 1, 1934
- National clinic courier (American birth control league)
N Y, vol 1, no 1, Oct 1935
- Patologia comparata della tubercolosi
Milano, vol 1, no 1, April 28, 1935
- Population literature (Population association of America)
Washington, vol 1, no 1, May 1, 1935
- Quarterly bulletin of the Sea View hospital
N Y, vol 1, no 1, Oct 1935
- Reports on chronic rheumatic diseases
London, no 1, 1935

- Revista argentina de cardiologia
Buenos Aires, vol 1, no 1, March-April 1934
- Revista española de las enfermedades del aparato digestivo y de la nutrición
Madrid, vol 1, no 1, Jan 1935
- Revista de leprologia de São Paulo
São Paulo, vol 1, no 4, Nov 1935
- Revista de neurologia e psiquiatria de São Paulo
São Paulo, vol 1, no 1, Oct 1934
- Revue d'immunologie
Paris, vol 1, no 1, Jan 1935
- South African journal of medical sciences
Johannesburg, vol 1, no 1/2, Sept 1935
- U S Department of labor Children's bureau Maternal and child welfare
bulletin
Washington, no 1, 1935
- Zeitschrift für die gesamte Naturwissenschaft
Braunschweig, vol 1, no 1/2, April 1935

PROCEEDINGS OF ACADEMY MEETINGS

JANUARY

ANNUAL MEETING

January 2

- I EXECUTIVE SESSION—*a* Reading of the minutes *b* Election of Members *c* Presentation of diplomas *d* Presentation of miniature and medals of Dr William H Park
- II PRESENTATION OF ANNUAL REPORTS—(to be read by title) The Council The Trustees The Treasurer Committees
- III PAPERS OF THE EVENING—*a* The history of organized medicine Frederic E Sondern
b The relations of the Academy to the public and to the profession Eugene H Pool

STATED MEETING

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)

January 16

THE FOURTH HARVEY LECTURE The Interaction between the Parathyroid and the Hypophysis and Pancreas A B Houssay Director The Institute of Physiology University of Buenos Aires

This lecture took the place of the second Stated Meeting of the Academy for January

SECTION MEETINGS

SECTION OF SURGERY—January 3

- I READING OF THE MINUTES
- II PRESENTATION OF CASES—*a* Non specific infective granuloma of the sigmoid Ben Henry Rose Discussion A O Wilensky *b* Perforating diverticulum of the sigmoid and abscess of the mesentery Irwin Siris Discussion John Morris Frank C Yeomans E G Ramsdell
- III PAPERS OF THE EVENING—*a* Late results in perforated peptic ulcer treated by simple closure Myron A Sallick Discussion Richard Lewisohn R H Kennedy *b*

Unrecognized post operative infection as a cause of the syndrome of so called liver shock Arthur S W Touroff Discussion Frederic Bancroft Kenneth Lewis c Abdominal puncture in the diagnosis of acute intraperitoneal lesions A fourteen years experience Harold Neuhoof Discussion Ralph Colp John Garlock, F Bancroft

IV GENERAL DISCUSSION

SECTION OF DERMATOLOGY AND SYPHILOLOGY—January 7

I READING OF THE MINUTES

II PRESENTATION OF CASES—a Vanderbilt Clinic College of Physicians & Surgeons b Miscellaneous Cases

III DISCUSSION OF SELECTED CASES

SECTION OF HISTORICAL AND CULTURAL MEDICINE—January 8

I EXECUTIVE SESSION—a Reading of the minutes b Appointment of Nominating Committee

II PAPERS OF THE EVENING—a Beethoven from a doctor's viewpoint with special reference to his deafness Irving Wilson Voorhees (by invitation) b Santiago Ramon y Cajal Mr William C Gibson (read by Eugene Reyes Perez) (by invitation) c The role of the Nestorians in medical education and practice during the intervening period between Greek and Arabic medicine Allen O Whipple

III GENERAL DISCUSSION

SECTION OF PEDIATRICS—January 9

From the Department of Pediatrics New York University College of Medicine and the Children's Medical Service of Bellevue Hospital

I PAPERS OF THE EVENING—a The treatment of gonococcus vaginitis Eleanor Adler (by invitation) b Some indications for complete urological study Meredith F Campbell, c Body build and disease in childhood Harry Bakwin, Ruth M Bakwin, d Public health methods in a private school Lucy Porter Sutton e The value of lateral and eccentric Roentgenograms of the chest Charles Hendee Smith

II GENERAL DISCUSSION—Robert Lewis (New Haven) Jacques M Lewis Charles H Smith Philip Van Ingen, Thomas E Waldie

COMBINED MEETING OF THE SECTION OF NEUROLOGY AND PSYCHIATRY and THE NEW YORK NEUROLOGICAL SOCIETY—January 14

I CASE PRESENTATION—Actinomycotic meningitis Harold Levy (by invitation) Discussion Josephine B Neal Alfred Plaut

II PAPERS OF THE EVENING—a Ventriculography with colloidal thorium dioxide Walter Freeman Washington D C (by invitation), H H Schoenfeld, Discussion Charles T Schwartz Leo M Davidoff John E Scarff, Cornelius Dyle b Visualization of the cerebral vessels by direct intracarotid injection of thorium dioxide (thorotrast), Abraham Myerson Boston (by invitation) Discussion Julius Loman Israel Strauss, Cornelius Dyle Harold G Wolffe Walter Freeman, Richard M Brickner

SECTION OF ORTHOPEDIC SURGERY

The regular January meeting of the Section of Orthopedic Surgery was not held

SECTION OF GENITO URINARY SURGERY—January 15

I READING OF THE MINUTES

II PAPERS OF THE EVENING—a Department of Urology (James Buchanan Brady Foundation) with brief references to the progress of urology in New York Hospitals Oswald S Lowsley (read by Thomas J Kirwin) b Early history of urology in New York City with brief reference to the establishment of the American Urological Association Colin Luke Bregg

III ADDRESS—a Foreword Terry M Townsend b The evolution of prostatic resection William Niles Wishard Indianapolis (by invitation)

SECTION OF OTOLARYNGOLOGY—January 15

Program Presented by the Staff of Otolaryngology of St. Vincent's Hospital

- I READING OF THE MINUTES
- II PRESENTATION OF CASES AND SPECIMENS—(Will take place between 8 and 8 30 o'clock.)
- III CASE REPORTS (abstracted)—a Laryngeal conditions 1 Vocal nodules 2 Polyp of vocal cords—2 cases 3 Epithelioma vocal cord 4 Carcinoma laryngectomy John J. Madden (by invitation) b Para-pharyngeal infections 1 Chronic sialadenitis (submaxillary) 2 Abscess of submaxillary gland with calculus 3 Retropharyngeal cellulitis tracheotomy 4 Acute tonsillitis retropharyngeal abscess parotid gland abscess Earl E. Baker (by invitation) c Management of face injuries 1 Fracture superior maxilla (infraorbital bones) 2 Fracture of nasal bones fracture of superior maxilla laceration of nose and face fracture of clavicle laceration of knee 3 Resume of cases of fractured nasal bones Joseph E. Dempsey (by invitation) d Mastoid conditions 1 Facial paralysis in adult—pre-operative (acute mastoiditis) 2 Massive osteoma of external auditory meatus with osteoma of temporal bone 3 Osteomyelitis of zygoma post-operative on mastoid 4 Acute purulent otitis media acute mastoiditis bilateral septicemia Raymond J. Gaffney (by invitation) e Esophageal conditions 1 Imperforate esophagus 2 Carcinoma of esophagus—2 cases 3 Cardiospasm mistaken for carcinoma of the esophagus Anthony Nigro (by invitation) f Malignancies of the ear nose and throat 1 Epithelioma(?) of ear 2 Lympho sarcoma of nasopharynx—2 cases 3 Carcinoma of oral sinuses—2 cases 4 Lympho sarcoma of tonsil—2 cases 5 Epithelioma of cheek 6 Carcinoma of larynx—3 cases Mark E. Pullen (by invitation)
- IV PAPER OF THE EVENING—Regional anesthesia in ear nose and throat surgery John M. Lore

V GENERAL DISCUSSION

SECTION OF OPHTHALMOLOGY—January 20

- INSTRUCTIONAL HOUR 7 00-8 00—Thomas H. Johnson—Neuro ophthalmology
- SLIT LAMP—DEMONSTRATION OF CASES 7 30-8 30—Milton L. Berliner Girolamo Bonoccalto Gordon M. Bruce Wendell L. Hughes
- DEMONSTRATION OF ILLUMINATING DEVICE FOR PERIMETER 7 30-8 30—Louis H. Schwartz (by invitation)

Regular Program

- I READING OF THE MINUTES
- II APPOINTMENT OF COMMITTEE TO NOMINATE NEW MEMBER OF ADVISORY COMMITTEE
- III PRESENTATION OF CASES—a The typical lens changes of myotonic dystrophy (5 minutes) Charles O. Rice Brooklyn (by invitation) b Non penetrating diathermy successfully used in two cases of detachment of the retina (5 minutes) Raymond Meek c Report on microscopic findings in two cases of retinal detachment treated by diathermy (5 minutes) David Wexler
- IV PAPERS OF THE EVENING—a Pericorneal vascular obliteration for various types of keratitis (20 minutes) Trygve Gundersen Boston (by invitation) Discussion P. Chalmers Jameson Brooklyn (by invitation) b Intracapsular cataract extraction—the indications and methods (20 minutes) Arnold Knapp Discussion Webb W. Weeks

COMBINED MEETING OF SECTION OF MEDICINE and NEW YORK DIABETES ASSOCIATION

January 21

Symposium on the Significance of Blood Sugar

- I PAPERS OF THE EVENING—a The effect of carbohydrates on bacterial growth and development of infections (25 minutes) Stanhope Bayne Jones (by invitation) b Blood sugar in experimental diabetes (25 minutes) H. E. Himwich (by invitation) c Blood sugar in diabetes mellitus (20 minutes) Edward Tolstoi (by invitation) Discussion (5 minutes each) Elaine Ralli H. Rawle Geyelin H. J. Spencer F. M. Allen H. O. Mosenthal

SECTION OF OBSTETRICS AND GYNECOLOGY—January 28

Program Arranged by the Obstetrical and Gynecological Divisions of the Bronx Hospital

- I OPENING REMARKS Meyer Rosensohn
- II PRESENTATION OF CASE REPORTS—
 - a Purpura hemorrhagica complicating the puerperium (3 minutes) A Charles Posner (by invitation), b Accidental hemorrhage cesarean, hysterectomy (3 minutes) Charles W Frank (by invitation), c Chorio epithelioma
 - 1 Clinical aspects (10 minutes) Irving Smiley (by invitation)
 - 2 Pathological and hormonal aspects, with lantern slide presentation (15 minutes) Joseph Felsen
- III PAPERS OF THE EVENING—
 - a Report of the obstetrical department (lantern slides) (10 minutes) J Irving Kushner (by invitation)
 - b The relation of the roentgenologist to obstetrics (10 minutes), William Snow (by invitation)
 - c The relation of the ophthalmologist to obstetrics (10 minutes), Nathan Goodfriend
 - d The relation of the dermatologist to obstetrics (10 minutes) Adolph Rostenberg
 - e The orthopedist in injuries of the new born (10 minutes), Sigmund Epstein
 - f The obstetrician as an internist (10 minutes) Meyer RosensohnDiscussion opened by Hervey C Williamson Herbert F Truitt Adolph Posner (by invitation) Louis Hauswirth

AFFILIATED SOCIETIES

NEW YORK MEETING OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
AT THE NEW YORK ACADEMY OF MEDICINE—January 15

- I Detoxication of phenylacetic acid by chimpanzee F W Power (Introduced by L R Cerecedo)
- II Effect of iodine on absorption of cholesterol F H Shillito K B Turner
- III Cevitamic acid excretion in pneumonitis and some other pathological conditions J G M Bullowa I A Rothstein H D Ratish E Harde
- IV Vaccination of human subjects with virus of human influenza T Francis Jr T P Magill (Introduced by Rufus Cole)
- V Tissue cultures as a more sensitive method than animal inoculation for detecting equine encephalomyelitis virus, H R Cox (Introduced by P K Olitsky)
- VI Host age and cell metabolism in mouse lymphatic leukemia J Victor J S Potter
- VII Hormonal factors affecting vaginal smears in castrates and after menopause U J Salmon, R T Frank
- VIII Separation of gonadotropic from luteinizing hormone in pregnancy urine S Caspe H Caspe (Introduced by F Krusnow)

NEW YORK ROENTGEN SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE

This regular January meeting of the New York Roentgen Society will not be held. Instead the members of the New York Roentgen Society will join with other Eastern radiologists at a meeting which will be held in Baltimore Md., on January 31 and February 1, 1936. The headquarters will be at the Lord Baltimore Hotel.

This meeting is sponsored by the Radiological Section of the Baltimore City Medical Society. Secretary Dr W B Firor, 11 North Charles Street.

NEW YORK PATHOLOGICAL SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE

January 23

- I CASE REPORTS
- II PAPERS OF THE EVENING—
 - a A typical amyloidosis with involvement of the lungs Henry W Ferris
 - b Two instances of Fleckmilz of Feitis H Brody (by invitation)
 - A Z Kalisch (by invitation)
- III EXECUTIVE SESSION—Election of officers

DEATHS OF FELLOWS OF THE ACADEMY

BOOTH, JAMES ARTHUR, A B, M D, 4 West 13 Street, New York City, graduated in medicine from the College of Physicians and Surgeons in 1882, elected a Fellow of the Academy October 5, 1885, died December 22, 1935. Dr. Booth before his retirement, was connected with the Manhattan Eye, Ear and Throat Hospital, New York Hospital, Polyclinic Hospital, West Side Hospital and Northern Dispensary. He was at one time president of the New York Medical-Surgical Society, chairman of the Section of Neurology and Psychiatry of the Academy and a member of the American Neurological Association.

COHEN, JOHN, M D, 1801 Weeks Avenue, New York, graduated in medicine from Harvard Medical School in 1921, elected a member of the Academy November 27, 1934, died January 24, 1936. Dr. Cohen was a Fellow of the American Medical Association and a member of the County and State Medical Societies. He was adjunct assistant physician to the Beckman Street Hospital, adjunct physician to the Montefiore Hospital and assistant bacteriologist to The Mount Sinai Hospital.

LEAHY, SYLVESTER RICHARD, M D, 825 West End Avenue, New York City, graduated in medicine from Yale University School of Medicine in 1905, elected a Fellow of the Academy February 26, 1921, died January 29, 1936. Dr. Leahy was a Fellow of the American Medical Association, a member of the State and County Medical Societies, the American Psychiatric Association and the Association for Research in Nervous and Mental Disease. He was professor of psychiatry at New York University, assistant neurologist and clinical psychiatrist to the Vanderbilt Clinic and Neurological Institute, neurologist to St. Elizabeth's and consultant neurologist to Kings Park Hospital.

MOSS, ABRAHAM, M A, M D, 12 East 86 Street, New York City, graduated in medicine from Cornell University Medical College in 1903, elected a Fellow of the Academy January 9, 1924, died January 20, 1936. Dr. Moss was formerly head of the cardiac department of the Broad Street Hospital and was a member of the Harvey Society and the American Medical Association.

RAHTE, WALTER EUGENE, M D, 525 Park Avenue, New York City, graduated in medicine from the University of Pennsylvania School of Medicine in 1901, elected a Fellow of the Academy January 28, 1927, died January 29, 1936. Dr. Rahte was a Fellow of the American Medical Association and a member of the State and County Medical Societies. He was assistant physician to the Post-Graduate Hospital and on the staff of the West Side Hospital.

WILLARD, THOMAS H, M D, 44 Riverside Drive, New York City, graduated in medicine from Albany Medical College in 1887, elected a Fellow of the Academy November 4, 1893, died January 23, 1936. He was a Fellow of the American Medical Association and a member of the County and State Medical Societies. For forty-two years of his professional life, Dr. Willard had been associated with an insurance company.

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"FALKIRK *in the* RAMAPOS"

Theodore W. Neumann, M D , Physician-in-Charge

CENTRAL VALLEY Orange County NEW YORK

ancestors were hardy Colonials of English and Scotch-Irish descent. His father, John Sims, had little education until late in life and was therefore most desirous that his son should have every educational advantage. He wished him to be a lawyer, his mother Mahola MacKey Sims, wanted him to be a minister, and to their great disappointment he chose medicine, not for any love for it, but his dislike for medicine was less than his dislike for the law or the ministry.

Sims' preliminary education consisted of instruction in local schools. He then spent two years in Columbia College, S. C., graduating in 1832, after which he commenced to read medicine with Dr. Churchill Jones in Lancaster. Sims says he was a great surgeon and that he received his inspiration for surgery from him. He then studied at the Charleston Medical School in 1833, after which he went to Jefferson Medical College in Philadelphia, graduating in 1835. There he had the benefit of working under Dr. George McClellan, a great surgeon and father of the Civil War General, for whom he had a great admiration.

He then returned to Lancaster to practice, but after his first two patients died, he moved to Mt. Meigs, Alabama, and later to Montgomery where he settled permanently. He rapidly established a reputation as a surgeon of ability. In 1837 he had removed the lower jaw without mutilation, and the superior maxilla for a tumor of the antrum in another instance. He was the first surgeon in the South to treat clubfoot successfully, and one of the first to operate on strabismus. He also operated with success on harelip, which he reported in the *Journal of Dental Surgery* in 1845 and which was his first publication.

In 1845 he first encountered the condition of vesico-vaginal fistula and in line with the opinion of the day pronounced it incurable.

In those days the obstetric forceps were not in general use, and there was a lack of obstetric knowledge and care, and therefore not infrequently the baby's head became

impacted and compressed the bladder against the pelvic bones for hours, which resulted in devitalizing the tissues so that in a few days they sloughed out leaving a vesicovaginal fistula. These pitiable patients were to be found in every community with no hope of cure.

Shortly after Sims saw his first case, he saw three others all in negro slaves. The morning after he had seen the last case he was called to attend a woman who had been thrown from her pony. Sims found her with great pain in her back and vesical and rectal tenesmus, and a digital examination disclosed an acute retroversion of the uterus. He then remembered the teaching of Professor Pirolean in the Charleston Medical College, that in such a case he should place the patient in the knee chest position, and try to reduce the dislocation with one finger in the rectum and another in the vagina.

He, therefore, placed his patient in the knee chest position and on retracting the perineum with his fingers, to his great surprise the air rushed in ballooning the vagina, and on turning the woman on her side he heard the air escape. He at once realized that the posture had allowed the intestines to be displaced from the pelvis leaving a vacuum and that the air distending the vagina would permit of an access for examination and operation such as had never been available before.

He immediately returned home, having bought a pewter tablespoon on the way, and placed the negro slave, whom he had previously dismissed as incurable, in the knee chest position, introduced the bent handle of the spoon when in his own words "he saw everything as no man had ever seen before. The fistula was as plain as the nose on a man's face."

Sims worked for four years before he succeeded in curing his first case. He established a hospital with twelve beds in his yard for these patients who were negro slaves, and he operated forty times on three patients and twenty one times on one of them during this experimental work.

His four years of failure was due to infection of his sutures as this was before the days of asepsis or antiseptis, and also there was no anaesthesia. During this work he devised the method of fastening the sutures in inaccessible locations with a perforated shot. It was not until he picked up a piece of spiral spring wire one day when he hit upon the idea of using silver wire for suture material instead of silk that he achieved success, as the silver wire sutures did not become infected and therefore allowed the wound to heal. An S shaped self retaining catheter made of block tin, which he devised, was an essential part of his technic.

"Anarcha" his first successful case had been operated on thirty times, and when the time came to remove the sutures he wrote "with a palpitating heart and an anxious mind I turned the patient on her side, introduced the speculum, and there lay the suture apparatus just exactly as I had placed it. There was no inflammation, there was no tumefaction, nothing unnatural, and a very perfect union of the little fistula." Sims' original report was published in the American Journal of the Medical Sciences, 1852, XXIII, January.

Shortly after this Sims succumbed to a severe dysentery which rendered him an invalid for six years, but which resulted in his seeking health in a northern climate and his coming to New York in 1853.

He received a cold reception from the profession in New York, although he was able to demonstrate his operation successfully on a patient of Dr. Valentine Mott.

He proposed to found a hospital for women, especially for the cure of cases of vesicovaginal fistula, but he met stubborn opposition from the medical fraternity. In 1854 however through the influence of a newspaper reporter, Henry L. Stuart, who had heard of Sims' work, and through the friendship and help of Dr. John W. Francis, who stood high in the profession, a call was issued for a public meeting to be addressed by Sims on the importance of organizing a special hospital for women. The New York papers of

May 17, 1854 carried the following announcement due to Stuart's influence,—"Lecture on the Necessity of Organizing a Great Hospital in the City for the Diseases Peculiar to Females,—the undersigned will deliver a lecture on this subject at the Stuyvesant Institute, No 659 Broadway, on Thursday evening, the 18th inst at eight o'clock The medical profession and the public are respectfully invited to attend J Marion Sims, M D, 77 Madison Ave"

Seven hundred invitations were sent out, and in spite of a heavy rain some two hundred and fifty doctors and laity filled the hall, and as a result a Committee was appointed to launch the project

Professional jealousy however, seemed to overwhelm Sims' efforts and doom him to failure when the timely support of a few influential farsighted women came to his aid, and thus in spite of bitter opposition of the medical men then dominant in New York, the Woman's Hospital came into being and opened its doors on May 4th, 1855 at 83 Madison Avenue in a house rented for the purpose The successful launching of the hospital was due to Dr Fordyce Barker, Dr Francis, Dr Mott and Dr Stevens This first Woman's Hospital had about thirty beds

Sims was fortunate in procuring Thomas Addis Emmet as his assistant, and the first patient was Mary Smith, an immigrant from Ireland, who had a bad fistula which her Irish physician had attempted to alleviate by introducing a wooden seine bob, or float, to stop the opening This had become incrustated with phosphatic deposit This patient was relieved of her infirmity after many operations so that she was able to serve as a nurse in the hospital

Anaesthesia was not in use at the hospital until the close of the Civil War

We cannot speak of the early days of the hospital without referring to Margaret Brennan, who, Emmet has stated, was the pioneer nurse in this specialty She was illiterate but a most remarkable woman whose whole life was guided by an earnest wish to discharge her duties faithfully and

serve God through her unselfish care of others. For forty years she served as assistant holding the speculum for Sims and Emmet.

The hospital was closed for three months in the summer as it was thought that wounds did not heal well in hot weather.

The first anniversary of the Woman's Hospital was held in Clinton Hall in Astor Place on February 9th, 1856, and from this time the hospital flourished. A charter was obtained in 1857.

While the first patients in the hospital were sufferers from vesicovaginal fistula, various gynecological operations were soon developed, until the fame of the institution as a fountain head of knowledge for the cure of the many ailments peculiar to the sex became widespread throughout the land, and the hospital became a Mecca for all who wished to perfect themselves in gynecology.

Through Sims' efforts the city of New York gave to the hospital in April, 1858 the plot of land situated between 49th and 50th Streets and Lexington and Park Avenues, which was the old potter's field during the cholera epidemic of 1832. Many thousands of bodies had to be removed and reburied on Ward's Island. This is where the Waldorf Astoria Hotel now stands.

A new hospital was built and opened for patients October 12, 1867. It had accommodation for seventy-five patients. In September, 1877, a second building similar to the first was completed and opened.

This property was sold in 1902 and the present hospital, the third, on West 110th Street was opened in December, 1906.

With the successful establishment of the Woman's Hospital, Sims' position as a leader in gynecology was definitely recognized.

In 1861 he went to Europe and was immediately received with great cordiality by the profession in Ireland, England, Scotland and in France and Belgium. He successfully performed his operations in famous clinics throughout Europe. He operated successfully on five cases in succession in Paris, and also in London and Brussels. His first case operated on in London was at the Samaritan Hospital and unfortunately the patient died. This is the first case he had ever lost from his operation. In short, he created such a furor and his European reputation became so great that he had a large consultation practice and had as his patients many of the titled aristocracy, among whom was the Empress Eugenie, wife of Napoleon III.

Sims remained abroad during the period of the Civil War in part due to his Southern sympathies. By 1865 he had reached general and authoritative recognition in America largely as a result of his great success in Europe. The honors and renown that followed were a natural sequence.

In 1870 while in Paris he helped to organize the Anglo-American Ambulance Corps for service in the Franco-Prussian War. He was sent as a member of the Corps with a staff of seven American and English surgeons. He was on the battle field of Sedan in charge of a military hospital of four hundred men, treating both French and Prussian wounded. When General Sherman Mahon was wounded at Sedan he accompanied him to the field.

While in London in 1869 he published his book "Clinical Notes of Uterine Surgery" which was issued simultaneously in English, German and French. Its publication attracted much attention and awakened the profession throughout the world to American gynecology of which he may be justly termed the father.

Sims returned to the Woman's Hospital in 1872, but resigned in 1874, on account of an absurd rule passed by the Lay Board of Managers that a due regard for the modesty of the patient required limiting the number of

spectators to fifteen. Sims had any number of spectators, both American and foreign, so when the hospital refused to alter this rule the hospital's father resigned.

Marion Sims died suddenly on November 13, 1883 and was buried in Greenwood Cemetery.

In reviewing Sims' contribution to gynecology it is interesting to note that his great achievement in the cure of vesicovaginal fistula was not priority as practically the main points in his technic had been attempted by various operators. Prior to Sims, favorable results in the operation of vesicovaginal fistula were incidental rather than the result of a logical and rational method of procedure. His success was due to first—the discovery of a method of access and exposure of the lesion, by posture and his speculum, second—silver wire sutures (aseptic), third—a self-retaining block tin catheter,—and as has been pointed out by Bissell he popularized a technic which was simple in principle and more universally applicable than any technic previously devised.

Sims in his first operations for vesicovaginal fistula employed the knee chest posture, but he soon utilized the lateral prone position which is now known everywhere as the Sims posture. In his first work the direction of the denudation was transverse to the vaginal axis, but later became longitudinal. A spear pointed straight needle was used at first and the edges of the denuded fistula were held in apposition by a lead clamp on each side of it, which were fastened with silver sutures, crushed shot anchoring the sutures against the proximal clamp.

According to Emmet, Sims first suggested bimanual examination. He invented the depressor, the tenaculum, a flexible copper sound and a uterine elevator. He first introduced glycerin on vaginal tampons. He devised block tin pessaries which could be given any shape, and he was the first to abandon barbarous quill sutures in operating on the perineum, using interrupted silver wire instead.

He was the pioneer in anterior wall surgery for cystocele and in operations for prolapse. Sims wanted to do a laparotomy but was opposed by his consultants and did not do his first ovariectomy until 1860.

In 1846 Sims published an article on "The Nature and Cure of Trismus Nascentium" in the American Journal of Medical Sciences. Sims' theory as to the nature of this injury was not accepted by the profession however until some forty years later when Dr. J. F. Hartigan of Washington, D. C., in 1884 confirmed the truth of Sims' theory in an essay on the "Pathology and Treatment of Trismus Nascentium or Lockjaw in Infants" in the same Journal.

Sims originated the operation for cholecystotomy without knowledge that Robb of Indiana had preceded him by a few months.

On October 6, 1881 Sims presented an epoch making contribution before The New York Academy of Medicine entitled "The Careful Aseptic Invasion of the Peritoneal Cavity for the Arrest of Hemorrhage, the Suture of Intestinal Wounds and the Cleansing of the Peritoneal Cavity and for All Intra-peritoneal Conditions."

Quoting from his own experience in the Franco-Prussian War he courageously promulgated these rules for gunshot injuries of the abdomen,—first—the wound of entrance should be enlarged sufficient for a thorough inspection,—second—injuries should be sutured and bleeding vessels ligated,—third—a search for extravagated matter and cleansing of the cavity,—fourth—the surgeon must judge as to the advisability of drainage.

In addition Sims contributed some seventy eight or more articles on a variety of gynecological and other subjects. "The Story of My Life," his autobiography, was published after his death, and edited by his son.

He was the recipient of numerous decorations from foreign governments, among them France's Commander of the Legion of Honor, Knight of the Order of Isabella the Cath-

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olic of Spain and Knight of the Order of Leopold of Belgium, and from Germany the Iron Cross, and two medals from the Government of Italy

While visiting in Budapest a few years ago I was conducted through the University Hospital by the Professor of Gynecology who proudly pointed out to me the name over one of the wards which had been dedicated to Marion Sims

He was one of the founders of the American Gynecological Society and its President in 1880 He was the President of the American Medical Association in 1876 In 1881 Jefferson University conferred upon him the Degree of Doctor of Laws He also received Honorary Membership in many Foreign Scientific Societies

A gifted orator has said of him, "He possessed the qualities ideal in the make-up of a truly great surgeon, namely, the brain of an Apollo, the heart of a lion, the eye of an eagle and the hand of a woman"

The J Marion Sims Asylum for the Poor was founded by him in Lancaster, S C

Immediately after his death a movement for the erection of a memorial to his memory was inaugurated in Europe and his native country This was a spontaneous gift from his brothers in his profession throughout the civilized world, and from many of the unfortunate beings his genius and skill had benefited This monument was erected in Bryant Park, New York in 1894, and was moved to a new site on the borders of Central Park on Fifth Avenue and 103rd Street, opposite the Academy of Medicine, where it was erected on a more beautiful pedestal It was rededicated on October 20, 1934, with appropriate ceremonies, at which Dr Sachs, President of the Academy, presided *

The inscription on the old pedestal of this monument tells the story of his career —

* There was an exhibit of mementos relating to Sims and the early history of the Woman's Hospital including instruments used by him, the first records of the hospital, and his literary contributions which were arranged through the courtesy of Dr Malloch

J MARION SIMS, M D , LLD

Born in South Carolina, 1813, died in New York City in 1883

Surgeon and Philanthropist

Founder of the Woman's Hospital of the State of New York

His brilliant Achievements carried the fame of American
Surgery throughout the civilized world

In recognition of his services in the cause of science and mankind
He received the highest honors in the gift of his countrymen
And decorations from the governments of France, Portugal,
Spain, Belgium, and Italy

And on the reverse —

Presented to the City of New York
By
His professional friends, loving patients
And
Many Admirers
Throughout the World

In his native state, South Carolina, in the capitol grounds has been erected in 1929 a very lovely monument with the inscription on the sides —

'The first surgeon of the ages in ministry to women,
treating alike empress and slave,"
and
"He founded the science of gynecology, was in all
lands honored, and died with the benediction of
mankind "

On March 14, 1922 the newly constructed operating theatre in the present Woman's Hospital was opened and on this occasion a bronze memorial tablet was unveiled and dedicated to the memory of J Marion Sims, the founder of the Woman's Hospital. Among the speakers was our beloved friend, Dr Henry C Coe. Coe in his remarks told how when a student at Harvard, Dr William H Baker, his teacher, brought a friend to his lecture whom he introduced as his former instructor and Attending Surgeon at the Woman's Hospital, Dr J Marion Sims, and asked him to talk to the students on a theme of his own choosing. He held the rapt attention of the class while he discoursed on "Cancer of the Uterus." In the words of Coe, "the bell rang for the close of the lecture and the Professor of Obstetrics, Dr Reynolds, walked in to be greeted with cries of "Go on, go on," and the courteous gentleman of the old school promptly urged Dr Sims to fill his hour and he did. What lecturer before or since could hold a class of restless students for two hours? He bowed to us, the door opened and he passed from our mortal vision forever. You remember when we used to read in Virgil and Homer how the Gods assumed the shapes of men and came down to talk to mortals. Their divinity was recognized only as they departed. So, in a dim way we felt as the door closed, that we had met face to face one who was endowed with the genius which made him one of the Immortals."



BEETHOVEN, FROM AN OTOLOGIST'S VIEWPOINT*

IRVING WILSON VOORHEES

New York

Fate never perpetrated a more malignant irony than that which sealed the hearing of the greatest of all makers of music. Fate, to be sure, seems to delight in making the way of genius hard, or one might think that Nature, when at rare intervals she endows a being with that matchless gift of imagination which enables him to penetrate to some of her deepest secrets, grows jealous, or fearful of her own handiwork and seeks to cancel the endowment. We need only think of Homer and Milton, blind, Keats gasping out his life when it was yet at its dawn, Heine on his bed of pain. It was of such things the German poet thought who wrote the brief, bitter line

Schwer ist das Leben—Life is hard

Born in the year 1770 everything about the life of Ludwig van Beethoven must be told in superlatives. In genius he was supreme, in eccentricities extreme, in his suffering, a very Prometheus—and like Prometheus, though tortured, indomitable, though broken, heroic, though vanquished, triumphant. But also like Prometheus, Beethoven did not fail to rage against his affliction. Some writers have pictured him as uncomplaining, accepting his deafness without heaviness of heart and with a song on his lips. A Pollyanna-Beethoven—absurd! Far from giving any such example of sweetness and light, the immortal Ludwig raged and fretted and dashed continually against the intangible bars of his captivity to silence. How little imagination they show who think that the man who could compose the Seventh Symphony could bear with equanimity the thought that he could never hear it!

* Read before the Section of Historical and Cultural Medicine, January 8, 1936

Beethoven was a man of great faith, possessed of indomitable will and at heart deeply religious. He was ever greatly concerned about his health, and he adverts to it time after time in letters to his physicians and to his intimate friends.

Beethoven's heredity was not of the best. His father was at least "moderately alcoholic," and used the little Ludwig rather roughly when in his cups,—this chiefly took the form of standing over the prodigy in threatening fashion and compelling him to practice at the piano. His grandmother came from a low estate and imbibed freely. There was also a tendency to tuberculosis in his mother. Whether this background suffices to explain his constant invalidism it is impossible to state, but his chief difficulty seems to have been a chronic inflammation of the intestines,—he suffered for years from colitis. He regarded this condition as possibly surgical, and for this reason remained in Vienna in order that he might have the services of the well-known surgeon Vering, among others, but he seems not to have had any operation, although he speaks of the tapping of the abdomen for the removal of ascitic fluid during the last days of his life as an "operation four times repeated." No surgeon, either then or now, would signify an abdominal paracentesis as an "operation" unless he did it for whatever "moral" effect it might have on the patient's condition.

Some physicians have thought that chronic intestinal toxemia may have been the indirect cause of Beethoven's deafness. Certain it is that he lamented his illness in no uncertain terms. In his Will dated October 10, 1802, he said:

'I take my leave of Thee (Life)—very sad—dear hope—to be cured at least in a certain measure—like the leaves of autumn—it has faded—I am departing—even the high courage that upheld me often in the lovely days of summer—it has vanished—O Providence—let one day of pure joy be mine once more—Oh when, O God, shall I be able to feel it again in the temple of Nature and of men—Never?"

This hopelessness it may be said was nearer to the beginning than the end of his invalidism, for he lived fully twenty-five years thereafter.

He changed physicians almost as many times as he changed his abode,—there is a record of twenty-seven removals—and he became vexed with all of them, even Dr Wegele, who was, perhaps with von Breuning his most intimate friend. One of them he calls a *most perfect ass* because he advised cold sponge baths, when “the patient is sure that warm baths would be better.” He complains of Dr Veering because he used an embrocation upon his arms and blistered them so that piano playing was impossible.

The deafness seems to have become noticeable in 1799. The onset was slow, yet within one year subjective noises became very distressing, and by 1801, he had definitely given up elaborate plans he had made to “travel half way round the world,” and decided to get what relief he could from Viennese physicians.

Writing to Dr Wegele, June 29, 1800, he says

“My hearing has become weaker and weaker for the past three years—Frank (another physician?) wanted to restore my health by tonics, and my hearing by oil of almonds—my hearing remained impaired, my digestion in its former condition—my ears’ they are ringing and singing night and day. I do think I spend a wretched life, for the last two years shunning all society, because I cannot bring myself to walk up to people and say, I am deaf. In any other profession this might pass, but in the one I have chosen, it is a wretched plight to be in—To give you a notion of the extraordinary deafness, I must tell you that I am forced in a theatre to lean up close to the orchestra in order that I may understand the actor (singer?) I do not hear the high notes of instruments or singers at a certain distance, and it is astonishing that there are individuals who never notice it while conversing with me—I sometimes hear those who speak in a low voice, that is to say the sounds, but not the words.”

He had enjoined secrecy upon everyone, and very few even among his faithful friends knew of the affliction until 1802. He had planned to be a conductor or a piano virtuoso, and had laid out very exalted schemes to enhance his name and fame, therefore, it is no wonder that the great blow fell heavily upon him. At this time he wrote the full details to Dr Wegele. His grief and anxiety could be no longer contained. There was always the horrible buzzing and whistling which otologists in these latter days always associate with nerve degeneration,—a condition that becomes

progressively worse and is beyond the reach of medical or surgical aid. He had frightful attacks of colitis and was "really miserable" during the entire winter of 1801. In dismay he wonders if there is any help for him in galvanism which is being talked about as a cure-all, for he has heard that a child in Berlin was restored from a condition of deaf mutism through electricity,—this information from a physician(?) It is perhaps necessary to state that deaf mutism is due either to a congenital absence of the auditory nerve, or some disease process which has destroyed both the auditory nerve cells and fibers. Nevertheless, in this supposedly enlightened age, the deaf and dumb are being "taken for a ride" in an airplane on the supposition that change of atmospheric pressure can make a difference in hearing capacity. But only the so called "middle ear catarrh" can even remotely be thus affected, and the relief, if any, must be only temporary. This in the presence of an auditory nerve somewhere near to normal.

Beethoven, apparently in a whimsical mood, told Charles Neate, English pianist, a "cock and bull" story to the effect that he, while rehearsing with a *primo tenore*, became so enraged by the singer's conduct that he threw himself upon the floor in a rage, and that when he arose he was surprised to find that he was deaf. All of this may have happened, except the deafness, because such a sudden attack could be brought about only through rupture of a blood vessel in the labyrinth,—so-called Ménière's disease, in which case the symptoms are so violent that the patient is very seriously ill. There is then great dizziness with sensations of whirling, so that the patient cannot stand, but must lie in bed, and nausea and vomiting are persistent and constant symptoms for from ten to fourteen days. None of these things are mentioned by the Maestro, and had they occurred, some note would have been taken of them by friends and companions during a fortnight of indisposition.

By the year 1810, the deafness was very thoroughly established and had long been noticed by the public. Writing to Wegeler in this year under date of May second, Beethoven says

I should be happy, perhaps the happiest of men, had not that demon taken possession of my ears. I have read somewhere that man should not part wilfully from this life whilst he could do one good deed, and but for this I should ere now have ceased to exist, and by my own hand too. Oh, life is so charming! but to me it is poisoned."

Not much has been said by his biographers concerning Beethoven's playing of the piano. It should not be overlooked that his musical career began with this instrument and may fairly be said to have ended with it. When he was about fifteen years of age he gave public performances which were well received, and his impecunious father had hopes of being able to live from the efforts of his talented son, but about this time, 1785, the son was appointed by the Elector, Max Franz, brother of Emperor Joseph II, organist to the electoral chapel, a post obtained for him by a patron of the arts, Count von Waldstein. He had received lessons on the organ from Van der Eder, court organist, and practised a great deal, becoming very fond of this instrument. He now received permission from the Elector, Franz, to visit Vienna, and he spent the winter of 1786-1787 in that great musical center. It was at this time that he made the acquaintance of Mozart who was then the leading light in "Harmony," and Beethoven was, of course, invited to play for Mozart. He was given a theme which he extemporized upon so gracefully that the older man was led to exclaim: "This youth will some day make a noise in the world."

Although his mentors intended that he should study with "Papa" Haydn, he seems not to have liked this master, and to his last days said that he had never gotten anything from Haydn, but Mozart became his great ideal, and he studied the works of the great harmonist until he knew them by heart. Unfortunately, however, Beethoven did not remain in Vienna very long on this first visit. He returned to Bonn where he worked with the piano, organ and violin under Pfeiffer who seems to have been a really great teacher, music director and oboist, and, although Beethoven has often been accused of ingratitude and there are sufficient grounds for this feeling, he never forgot Pfeiffer, and when circumstances permitted, he sent money to his old friend through M. Simrock of Bonn.

In 1792, Beethoven at 22, returned to Vienna and made it his home. Mozart had been dead for a year but his influence lived in the mind and heart of everyone, especially in Beethoven's. Vienna, the home of the Muses, appealed deeply to the young man's love of life and art, and he declared, "Here will I stay and not return to Bonn, even though the Elector should cut off my pension."

Beethoven was always associated with physicians either socially or intellectually or medically. One of his first sponsors in Vienna was the distinguished Dr. Van Swieten, physician in ordinary to Empress Maria Theresa, a man of great personal charm and culture who brought to his home every artist of any importance living in Vienna in that day. The Van Swieten home was a center for the playing of the compositions of Handel, Sebastian Bach, and the Italian masters, "performed with a full band." The doctor had an insatiable appetite for music and pressed Beethoven to perform for him after the others had gone, often far into the night, a half dozen or so fugues of Bach as a goodnight blessing! Through the Van Swietens, Beethoven met a number of important people, among them Prince Karl von Lichnowsky who became his industrious pupil, paying for his lessons a truly princely sum, and settling upon Beethoven six hundred florins a year which was to continue until the composer should receive a permanent appointment. The Princess, Christiane, by birth, Countess of Thun, seems also to have taken a fine fancy to Beethoven whom she ultimately succeeded in spoiling so completely that he turned upon his benefactor and precipitated one of the most disgraceful scenes recorded in musical annals. It so happened that a number of Prince Lichnowsky's friends were dining at the Palace, and after the good wine had stimulated fellowship to the point of intimacy, the Prince called upon Beethoven to entertain the guests by his playing. This the ingrate refused to do point blank, saying that "he was no cheap performer obliged to do his stunt for the sake of bed and board," and when the Prince urged him a little too forcibly, Beethoven picked up a chair and would have fractured the Prince's skull, had not some one intervened and

taken the chain away from the crazed artist. Of course Beethoven left the house for all time, but he was forgiven, nevertheless, by the Prince, although the old intimacy was never reestablished, as indeed it could not have been.

Many anecdotes are told concerning Beethoven's eccentricities. Early in life he bought a horse in order that he might ride for exercise, but he became so engrossed in his music that he forgot all about the horse and the poor animal starved to death. Then he took to walking, but his "walk" became a run over the ramparts of Vienna, during which he shouted, talked to himself, sang melodies and gesticulated wildly. One day his gestures so frightened a team of oxen (sic) that they ran away. He seems never to have been aware of the weather, but would go for one of his foot excursions in a pouring rain, and then come into the house shaking himself like a dog to the utter discomfiture of the inhabitants.

The artist, Hofel, was eager to paint a portrait of the master, and he agreed to a sitting, but after five minutes of this, he was seized with a sudden inspiration, rushed to the piano and improvised, completely oblivious of the circumstances. The portrait seems not to have been completed at any further sitting.

His friend and pupil, Ries, relates that returning with Beethoven from a walk one day, the latter rushed to the piano without removing hat or coat and played for an hour without stopping, but suddenly remembering the presence of Ries, said, "There won't be any lesson today," and went on with his improvisations.

When praised, Beethoven laughed boisterously and "ragged" his hearers by calling them idiots and making other uncomplimentary remarks.

In 1808, December 22nd, while conducting his Fifth Symphony for the first time, he stopped short, upbraided the orchestra for its stupidity, and in his excitement knocked over the candles which had been placed upon the

piano,—this, accidentally, one may surmise. Nevertheless, he would at times accept criticism from his inferiors — After his deafness had become complete, while he was rehearsing the Quartet in E Flat with four players, some one suggested leaving out the *meno vivace*. He watched for a few moments, agreed that this was good advice, and then crossed this part of the work from the score. But as a rule he was a law unto himself — A lesser composer once told him that it was wrong to compose in violation of the principles of harmony and that no one could get away with it. “You can’t, but I can,” was his response.

Beethoven was certainly hard to live with. Servants would not remain with him because he despised them. “I am in despair,” he says, “at being condemned by my deafness to spend the greater part of my life with this most abject class of person, and to be in some sense dependent on them.” He fell out constantly even with his best friends, but many of them swallowed the insults and contumely which he heaped upon them. However, to his credit, he would often voluntarily write the most abject apologies in an effort to smooth out his uproarious conduct.

But to offset all of these grosser abnormalities there was a lovely spirit of devotion to his brother’s child whom he took away from the mother after the father’s death. In it we see all of the pathos of the master’s life,—his celibacy, his unequalled love, his childlessness, his longing for companionship,—all of these gaps in his life which he was attempting to fill by an obtusive affection for his nephew. But this merely succeeded in spoiling the boy, just as the Lichnowskys had spoiled Beethoven in his young manhood. This boy seems to have been headstrong, ungrateful and even resentful of his Uncle’s attempted guidance, for he brought the hoary head down to the grave in sorrow because of his misdoings.

Beethoven at heart was deeply religious, although he never seems to have said much about it. He was a Catholic who neglected his church chiefly because he was not “denominational.” He was essentially a Deist. On his

writing table he always kept two inscriptions said to have been taken from the temple of Isis I I am that which is I am all that is, all that was, and all that shall be,—No mortal man hath my veil uplifted' II He is One, self-existent, and to that One all things owe their existence

Among his literary effects were found also two prayers Whether he copied them from the writings of some other man or whether he wrote them himself, they are, indeed, beautiful

"O God, Thou art the true, eternal, blessed, unchangeable light of all time and space Thy wisdom apprehends thousands and still thousands of laws, and yet Thou ever actest of Thy free-will and to Thy honor Thou wast before all — To Thee is due praise and adoration"

And again

"Spirit of spirits, who spreading Thyself through all space and who through endless time art raised high above all limits of upward struggling thought, from riot didst Thou command beautiful order to arise Before the Heavens were, Thou wast, and before systems rolled above and below us Before the earth swam in heavenly ether, Thou alone wast, until through Thy secret love that which was not sprang into being, and gratefully sang praises to Thee What moved Thee to manifest Thy power and boundless goodness? Wisdom beyond measure! How was it first manifested? Oh! Direct my mind! Oh! raise it up from this grievous depth"

About 400 note books were also among his effects, containing conversations written by others, and also some of his own thoughts But, among his doctors was an Italian, Bertolini, who in 1831, contracted cholera and ordered all of the many letters he had received from Beethoven to be burned Thus, possibly, we have lost some valuable data regarding the chronic invalidism as well as the opinions and reflections which the Master was wont to interhneate even in the most casual note to an acquaintance Of the note-books given by Dr von Breuning to Beethoven's biographer, Schindler,—137 are in the Berlin Library In one of them, reverting to his deafness he summons courage to aid him in his need

I will blunt the sword of Fate, it shall not utterly destroy me"

In 1814, he played the piano part to his trio in B major, opus 97, which marked his farewell to the public in so far as that instrument was concerned. He was now quite deaf. Ten years later, in 1824, he was present at the Vienna Academy of Music when the Kyrie, Credo, Agnus Dei and Dona,—all from the Missa Solemnis, were played before a large and distinguished audience. He stood at the right of the conductor, Umlauf, paying attention to the beat, but he did not hear anything of the performance, and he noticed the vociferous applause only when a singer, Caroline Unger, caught his sleeve and swung him around toward the audience. Nevertheless, much of his work following the hundredth opus was composed during this clouded period, among others, the 7th and 8th symphonies, the song folio "To the Distant Sweetheart", and the quartettes, a number of sonatas for piano, the Missa Solemnis and the ninth symphony. He had discussed with Malzel, inventor of the metronome, various hearing contrivances and experimented with some in the hope that it might be possible for him again to conduct an orchestra, but none of these things helped him, which goes to prove that his deafness was of the inner ear type.

Shortly after the incident recited above, Beethoven entered upon the period of his final illness. In 1824, he was besieged by the fear that he would die from apoplexy. Writing under date of August 1st to Dr. Bach: "I believe that sooner or later I cannot escape an apoplectic fit, such as my upright grandfather had and to whom I bear a likeness." There was probably high blood pressure, for he spat blood and had several nosebleeds. The following year he wrote to his nephew, for whom he was standing sponsor as already mentioned: "Death won't allow me a very long respite."

The autumn of 1826 marked the beginning of the end. Beethoven had been spending some time in Gneissendorf, a health resort in Austria, but desiring to return to Vienna once more, he started his journey on a frosty December day sitting on an ordinary milk cart which he described to Dr. Wawruch as "the most miserable vehicle of the devil." The

journey was broken by a night at a village inn where he slept in an unheated room under damp bedclothing. After midnight he developed a severe chill and chest pains. The next day he arrived in Vienna with a definite pneumonia, which subsided, however, by crisis on the 7th day, but a complication arose in the form of abdominal dropsy (ascites), the result of an unrecognized disease of the liver (interstitial hepatitis) which surely must have been present for months. Toward the end of December (the 20th), the distention became so great that it became necessary to introduce a needle through the abdominal wall (paracentesis) for the removal of fluid. A large quantity of serous exudate came away and there was much relief. This procedure had to be repeated, however, on January 8th, and again on February 2nd and 27th, 1827. After the second puncture Beethoven's unfailing sense of humor led him to remark to Professor Siebert "You seem to me as if you were Moses who smote the rock."

At this time Beethoven seems to have thought himself to be in dire straits financially, although after his death several bank shares were found among his effects, as well as other salable articles. Is it not possible that in his state of forgetfulness which had always been a characteristic, a condition made worse by disease, he had quite forgotten about the "hidden treasure"? In any case he wrote on March 14th, two weeks before his death, to his friend Moscheles "I have to fight with a hard lot, nevertheless, I subject myself to the dispositions of Fate, and I pray God that He may direct my fate so that ere my death ensues I shall not suffer from want." Moscheles then interceded with the London Philharmonic Society which had already purchased several of his works, and that organization sent him 100 pounds. It was not used, and after his death a question arose as to whether it should not be returned, but his executors declared against it and the money was kept as a part of his estate. With the gift a new hope came into Beethoven's mind, and the old creative instinct was once more aflame as shown by his letter of thanks eight days before he died, "I pledge myself to the Society, as a token

of my warmest gratitude, either to compose a new symphony, the scheme of which already lies on my desk, or a new overture, or something else, as desired by the Society, if the Almighty will soon give me health ”

Beethoven died on March 25, 1827, only a little over 57 years of age. There is cause for speculation as to what may have caused his life long ill health. Although his forbears had been somewhat alcoholic, he, himself is said to have been abstemious until a few weeks before death when his diet was chiefly eggs, which he washed down with quantities of wine. Perhaps his medical advisers seeing that he could not possibly recover allowed him to have anything he asked for. There is some authority for the supposition that he may have unwittingly contracted syphilis. This disease would account both for his chronic invalidism and his deafness. No one can be sure about this, but his deafness was certainly of the type seen in syphilis, although in fairness one should say that other toxic conditions give similar symptoms. It is not necessary that in acquiring this disease he should have transgressed moral laws. Venereal disease was prevalent in Europe in those days, in fact still is, and it would have been easy to have acquired the disorder in a perfectly innocent way. Not infrequently physicians and nurses become infected from patients, and it is reasonable to state that other persons may become likewise infected. It was nearly one hundred years later before we had anything like a definite diagnostic test, so that the number of “missed” cases must have been enormous. His cirrhosis of the liver may have been due to the toxins from his intestinal tract, if it were not due either to the racial poisons, alcohol or syphilis.

Unfortunately an autopsy was not performed until some 48 hours after death. In those days the technique of the mortuary was far from perfect, and histology was virtually unknown. Moreover, post mortem changes made judgment of pre existing disease virtually impossible. Dr. Johann Wagner reported that he found “the auditory nerves shrivelled and marrowless, the arteries running along them

stretched as if over a crow quill, and knotty. The left auditory nerve, which was much thinner than the other, ran with three very narrow grayish streaks, the right, with a thicker white one out of the fourth cavity of the brain. The circunvolutions of the brain which was soft and watery (post mortem change) appeared twice as deep as usual, and much more numerous."

As to the liver Wagner writes "It was shrunken to half its ordinary size (chronic interstitial hepatitis), as solid as tanned leather and was greenish blue. Its surface was covered with many irregularities (hop-nailed liver), and it contained numerous, hard nodules the size of a bean. All blood vessels in these nodules were constricted and thickened. The cartilage of the auricle was large and regular in form, the scaphoid (boatlike) depression and particularly its crevice, were abnormally wide and one and one-half times as deep as usual. The eminences and depressions protruded greatly."

In 1863, thirty-six years after Beethoven's death, an exhumation took place when a successful plaster cast was made by a Dr. Wittman, assistant at the Vienna Anatomic Institute. Anatomically, Beethoven's skull was not regular, particularly as to the "strongly developed frontal bone and upper part of the orbit, and the very large orbital cavities."

In old Vienna, on the Ringstrasse, one sees the Beethoven *Denkmal*, a beautiful sculpture representing the composer, seated, in a dressing gown, his hands folded across his left thigh, and his head turned slightly toward the right as if listening to the voices of Nature. At the right of the pedestal is a female figure, an angel holding aloft a wreath or baccalaureate emblem, at the left a male figure with the hands at the back, showing the strength of man fettered by invisible hands. At the foot of the pedestal and between the two above mentioned figures are images of five children, —two on each side, the central one holding a harp. To my way of thinking this is the most beautiful monument in a city so crowded with the evidences of culture.

Out in the *Zentral Friedhof*, Beethoven's remains were interred, and the spot is marked by a highly-artistic, marble obelisk. Near by is the grave of Schubert who asked to be buried "close to Beethoven." In the vicinity is the so called Mozart stone, but the burial place of Mozart, like that of Moses, is unknown. He was, according to rumor, put into an unmarked grave, the whereabouts of which were forgotten with the passing years. Thus Vienna, the city which they all loved, holds the mortal remains of these great masters of music,—Beethoven, Schubert and Mozart.

LIBRARY NOTES

NEW VOLUME IN HISTORICAL SERIES

The Library Publication Fund Committee announces that No. 5 in the "History of Medicine Series issued under the Auspices of the Library of the New York Academy of Medicine" has appeared. The author, a Fellow of the Academy, is Dr. Robert H. Halsey, and his work, an illustrated brochure of 58 pages, is entitled *How the President, Thomas Jefferson, and Dr. Benjamin Waterhouse, Established Vaccination as a Public Health Procedure*. Copies may be ordered for a dollar apiece from the Librarian on making out a cheque payable to the author.

Copies of other volumes of the Series may be obtained also. Last year *Andreas Vesalii Icones Anatomicae* was published. It is an atlas containing all the woodcut illustrations of the works of Vesalius, consisting, in almost every case, of fresh impressions taken from the original wood-blocks cut in 1543 and 1555. The price is \$122.50. In 1930 was issued Hieronymus Fracastorius, *De Contagione Libellus* [1546]. This consists of the Latin text, with English translation and notes by Wilmer Cave Wright, price \$3.00.

AN EXHIBITION OF BOOKS ILLUSTRATING THE GROWTH OF OUR KNOWLEDGE OF THE RESPIRATORY TRACT AND ITS DISEASES

Prepared by FRANK B BERRY, ISRAEL RAPPAPORT and GERTRUDE L ANNAN

CASES 15

From Hippocrates to Laennec and Louis

Prepared by G L ANNAN

1 HIPPOCRATES, b ca 460 B C

Octoginta Volumina

Rome, Franciscus Minitius Calvus, 1525 Opened at p CCCCVII

First printed edition of Hippocrates's collected works, showing his description of phthisis It has been noted that this description with a few changes and additions might well be included in any modern text-book

2 ARETAEUS (CAPPADOX) 2nd cent

Libri septem nunc primum e Tenebris eruti a Ivnio Pavlo Crasso

Venice, Junta, 1552 Opened at fo 6r

A classic account of pneumonia As a clinician Aretacus ranks next to Hippocrates His work is an important source for the teachings of the Pneumatic School

3 ORIBASIOS SARDIANUS 4th cent

Synopseos ad Eustathium Filium

Venice, Paulus Manutius, 1554 Opened at fo 165r

An early account of emphysema The writings of Oribasius contain little that is original, but are carefully compiled and are valuable in preserving the knowledge of his predecessors This "Synopseos" is an epitome of his large encyclopaedia It was especially prepared for the use of his son, Eustathius

4 CAELIUS AURELIANUS 5th cent

De Morbis acutis & chronicis, libri VIII

Amsterdam, Wetsteniana, 1709 Opened at p 429

An early description of asthma The author has been called the greatest Latin medical writer after Celsus (1st cent) The first complete edition of this work was published in Lyons in 1566

5 ALIENZOAR (Abu-Marwan 'Abd-al Malik ibn Zuhri) d 1162

Libri Theriari

Venice, Bonetus Locatellus for Octavianus Scotus, 1496 Opened at fo 18r, col 1, line 6

This passage gives the author's recommendation of the use of goat's milk in phthisis and tracheotomy Avenzoar was an eminent Moslem physician who had the courage to question the views of Galen

6 LANFRANC DE MILAN d ca 1306

En cyrurgie

Lyons, Jehan de la Fontayne, 1490 Opened at fo f₂r, col 1

An early record of an operation for empyema by the founder of French surgery A native of Milan, Lanfranc spent most of his life in Lyons

7 GUY DE CHAULIAC, d 1368

Inventorie or y^e Collectorye in cirurgicale parte of Medicene

Eng MS ca 1400 Opened at fo 152r, Bk 3, Doct 2, Chapt 5

A description of empyema by the most eminent French surgeon of his time This is one of the finest early medical manuscripts in English It came to the Academy with the rest of the library of Dr E C Streeter

8 DA VINCI, LEONARDO 1452-1519

Quaderni d'Anatomia Ventun Fogli della Royal Library di Windsor

Christiania, Dybwad, 1914 Opened at vol 4, fo 3r

A small sketch of the lung by the celebrated painter and anatomist A translation of his notations reads "This is the lung in its chest It is questioned where the lung is more cooled or more heated, and the same is searched for in the heart It is to be searched, if the wall of the heart, interposed between its two ventricles, is thinner or denser in the lengthening or in the shortening of the heart, or, you may say, in the dilation or in the contraction of the heart It is judged that in the dilation it increases capacity, and the right ventricle draws blood from the liver, and the left ventricle in such time draws blood from the right one, etc As many times as the pulse beats, as many are the times that the heart dilates and contracts itself The lung increases and decreases continually in every direction, but more downwards, because it is more useful for expelling the food out of the stomach"

9 FRACASIORIUS, HIERONIMUS 1478-1553

De Sympathia et Antipathia Rervm

Venice, heirs of Luc-Antonio Junta, 1546 Opened at fo 46r

First edition of his celebrated work on contagion This chapter entitled "De Phthisis Contagiosa" shows that he recognized the contagiousness of pulmonary tuberculosis He also noted that living with such patients was the chief cause of the disease

10 SERAPLIVS VILLANOVANUS, MICHAEL 1509?-1553

Christianismi Restitutio 1553

[Nuremberg, Rau for C Gotthelb von Murr, 1790] Opened at p 170

For years this has been considered the first description of the lesser circulation of the blood, but recently claims have been made that Ibn Nafis

described the lesser circulation in the thirteenth century Servetus was condemned to death for the "heresies" in the *Christianismi Restitutio*, and most of the copies of the original edition were burned with him. Even this reprint of 1790 is rare and valuable.

- 11 PARACELSUS, AUREOLUS PHILIPUS THEOPHRASTUS [Bombastus ab Hohenheim] 1493-1541

Von der Bergsucht und anderen Bergkrankheiten

In his *Samtliche Werke*, herausgegeben von Karl Sudhoff, 9 461-544, 1925. Opened at p. 463.

A modern edition of the first separate tract on miners' phthisis, originally published in 1567. A reference to the disease was made by Agricola in 1556, but he did not write an extensive description of it. Paracelsus was the revolutionary who first dared scorn the writings of the ancients.

- 12 VESALIUS, ANDREAS 1514-1564

De Humani Corporis Fabrica

Basel, Joannes Oporinus, 1543. Opened at p. 658.

First edition of the epochal work of Vesalius, "Father of anatomy." On the page referred to he shows how he induced artificial respiration in animals.

- 13 PARE, AMBROISE 1510-1590

The Workes of that famous Chirurgion

London, T. Cotes and R. Young, 1634. Opened at pp. 298-9.

The treatment of empyema by drainage and lavage, related by the greatest figure in the history of surgery, showing a woodcut of the cautery and plate to be used. This is the first English edition. The first French edition appeared in 1575.

- 14 MAYOW, JOHN 1643-1679

Tractatus quinque Medico-physici

Oxford, J. Crossly, 1674. Opened at pp. 300-1.

The first account of the substance now known as oxygen. Mayow was a chemist and physiologist of genius, and this work ranks with the best of English medical classics.

- 15 SYLVIUS, FRANCISCUS [de la Boe] 1614-1672

Opera medica

Amsterdam, D. Elsevir & A. Wolfgang, 1679. Opened at p. 689.

A tract on phthisis by one of the earliest teachers to introduce bedside teaching into the medical curriculum. He has been called an expositor rather than an investigator, but his work shows that he was not without original ideas. He found tubercles in the lungs at autopsy and recognized the tuberculous nature of diseased lymphatic glands throughout the body, and associated them with consumption. He seems to have been the first to do so. This is the first edition of his collected works.

16 WILLIS, THOMAS 1621-1675

Opera omnia

Lyons, J A Huguetan, 1681 Opened at vol 2, p 1 of the 3rd ser of pagination

'The best anatomical description of the lungs so far published' (Lawson Brown) Willis is best remembered for his exact account of the nervous system and the description of the circle of Willis which bears his name

17 HOOKE, ROBERT 1635-1703

An Account of an Experiment made by Mr Hook, of preserving Animals alive by blowing into their Lungs with Bellows

In Philosophical Trans Roy Soc London abridged, 1 194-5, 1809

This experiment, described by Hooke in 1667, had already been performed by Vesalius Hooke showed that the essential feature of respiration is not in its intrinsic movements, but in certain blood changes in the lungs

18 MALPIGHI, MARCELLO 1628-1694

Opera omnia

London, R Scott, 1686 Opened at pt 2, p 134

Malpighi, celebrated anatomist and greatest of microscopists, established that the bronchi terminated in minute air spaces

19 MORTON, RICHARD 1637-1698

Physiologia seu Exercitationes de Phthisi

London, S Smith, 1689

The most pretentious book on the subject written up to that time According to Fliet, "Clinically, it is the best presentation of the symptomatology of tuberculosis that has been written" Morton was both physician and minister He was a Fellow of the Royal College of Physicians

20 FLOYER, (SIR) JOHN 1649-1734

A Treatise of the Asthma

London, R Wilkin, & W & J Innys, 1726 Opened at p 203

The first account derived by dissection of the changes in the lungs now called emphysema This was first published in 1698 Floyer is remembered for his work on the pulse and on the benefits of cold bathing

21 AULNBURG, LEOPOLD 1722-1809

Inventum novum ex Percussione Thoracis humani

In de Wasserberg, F X Fasciculus primus Operum minorum Medicorum Vienna, 1775, 1 316-361

First published in 1761, this "immortal" contains the first record of the use of immediate percussion of the chest in diagnosis The importance

of Auenbrugger's work was not recognized until Corvisart published his translation of it in 1808

22 MORGAGNI, GIOVANNI BATTISTA 1682-1771

The Seats and Causes of Diseases

London, A. Millar, T. Cadell, Johnson & Payne, 1769 Opened at vol 1, p 557

This passage gives a description of the post-mortem appearance of consolidated lung, the texture being like that of solid flesh, written by the founder of modern pathology

23 LAVOISIER, ANTOINE LAURENT 1743-1794

Memoire sur la nature du principe qui se combine avec les metaux pendant leur calcination, & qui en augmente le poids

In *Hist de l'Acad Roy des Sci*, 1775, Paris, 1778, pp 520-526

Lavoisier discovered the true nature of interchange of gases in the lungs This is his first report on the subject This great chemist lost his life on the guillotine during the French Revolution This volume was lent through the courtesy of the Library of Columbia University

24 STARK, WILLIAM 1740-1770

The Works of consisting of clinical and anatomical Observations

London, J Johnson, 1788 Opened at p 19

This posthumously published work contains valuable studies of the cavities and the cause of hemoptysis It was of particular importance in the advancement of the knowledge of tuberculosis in England Before this appeared in print much of the material had been plagiarized from the manuscript by Thomas Reid in his *Essay on Phthisis pulmonalis*, 1782

25 BAILLIE, MATTHEW 1761-1823

The morbid Anatomy of some of the most important Parts of the human Body

London, J Johnson & G Nicol, 1793 Opened at p 52

The first accurate description of hepatization of the lungs in pneumonia Baillie was physician to George III, and carried on an extensive practice

26 BEDDOES, THOMAS 1760-1808, and WATT, JAMES 1736-1819

Considerations on the medicinal Use, and on the Production of factitious Airs

3 ed Bristol, Bulgin & Rosser for J Johnson, 1796

These essays advance the important therapeutic concept of treating certain diseases by placing the patient in a "factitious atmosphere" This general plan of treating respiratory troubles by inhalations of different gases is now standardized as pneumo-therapy Watt, the celebrated engineer, constructed the apparatus for this purpose Beddoes founded the Pneumatic Institute at Clifton

27 SPALLANZANI, LAZARO 1729-1799

Memoirs on Respiration

London, G & J Robinson, 1804 Opened at p 352

Spallanzani was the first to note that the tissues consume oxygen and produce carbon dioxide. This eminent investigator and physiologist died before this was published in 1803.

28 BAYLE, GASPARD LAURENT 1774-1816

Researches on pulmonary Phthisis

Liverpool, Longman, Hurst, Rees, Orme, and Brown, 1815

The basis of Laennec's and other subsequent work. Bayle first described the course characters of tubercle and its identity with the pulmonary granular and other varieties of tuberculosis. His *Recherches* appeared originally in 1810.

29 LAENNEC, RENE THEODORE HYACINTHE 1781-1826

De Pauscultation médiate

Paris, J. A. Brosson & J. S. Chande, 1819

First edition of the epochal work which is the foundation stone of modern knowledge of diseases of the chest and of their diagnosis by mediate auscultation. First to describe and differentiate bronchiectasis, pneumothorax, hemorrhagic pleurisy, pulmonary gangrene, infarct and emphysema, esophagitis, subclavicular bursa, etc. He was undoubtedly the greatest teacher of pulmonary tuberculosis.

30 LOUIS, PIERRE CHARLES ALEXANDRE 1757-1872

Recherches anatomico-pathologiques sur la phthisie

Paris, Gabon, 1825

Louis's contribution was the definite and permanent establishment of the facts which Bayle and Laennec had brought to light. He also placed the symptoms of tuberculosis in scientific relationship with the pathology of the disease. He worked for some years with Chomel at the Hôpital de la Charité.

CASE 6

Milestones on the Road to our present Knowledge of Tuberculosis

(Nineteenth and early Twentieth Centuries)

Prepared by I. RAPHAËL

31 VILLEMEN, JEAN ANTOINE 1827-1892

Études sur la tuberculose

Paris, Baillière, 1868 Opened at p 528

Villemin achieved an undying reputation by his proof that tuberculosis is a specific infection, due to an invisible, inoculable agent and transmissible by inoculation from man to lower animals. He was a professor at Val-de-Grace.

32 PARROT, JOSEPH MARIL JULES 1829-1883

[Le resultat des recherches sur les relations qui existent entre les lesions des poudrons et celles des ganglions trachéo-bronchiques]

In Comptes rendus des Seances et Mem de la Soc de Biologie,
6 s 3 308-309, 1876

His reports his discovery of the nature and distribution of the primary lesion of the lung. He was professor of diseases of children in the Paris Faculty.

33 KOCH, ROBERT, 1843-1910

Die Aetiologie der Tuberculose

In Berl klin Wochenschr, 19 221-230, 1882

The report of the discovery of the tubercle bacillus by Robert Koch, one of the greatest of German scientists.

34 FORLANINI, CARLO 1847-1918

A Contribusione della Terapia chirurgica della Fisi — Ablazione del polmone — Pneumotorace artificiale

In Gazzetta degli Ospitali, 3 537-539, 1882

The report of his first attempt to treat phthisis by artificial pneumothorax. He was the first to introduce this method of treatment. He was the director of the medical clinic at the Royal University, Pavia.

35 ADIRONDACK COTTAGE SANITARIUM FOR THE TREATMENT OF PULMONARY DISEASES

11th Annual Report

Saratoga Lake, N Y, 1886

The beginning of a new era in the treatment of tuberculosis in this country. Of Trudeau Osler wrote in the twenty-fifth Annual Report of the Sanitarium, "A triumph of optimism. This shows what a badly crippled man may do single-handed, once let him gain the confidence of his brethren, medical and lay." This copy of the report was lent through the courtesy of the Army Medical Library.

36 BREHMER, GUSTAV ADOLF ROBERT HERRMANN 1826-1899

Die Therapie der chronischen Lungenschwindsucht

Wiesbaden, Bergmann, 1887

The author was the founder in 1859 of the first sanatorium for pulmonary tuberculosis. He demonstrated that pulmonary tuberculosis was curable.

37 BARD, LOUIS 1857-1930

Formes cliniques de la tuberculose pulmonaire, classification et description sommaire

Genève, Kundig, 1901

Bard is known for his clinical classification of pulmonary tuberculosis, which is still the best. He was professor of hygiene at Lyons and of clinical medicine at Geneva.

38 NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS

Transactions of the first Annual Meeting, Washington, D. C., May 18th and 19th, 1905

New York, Irving pr., 1906

The first report of the organization which has done so much in the fight against tuberculosis.

39 VON PIQUET, VON CSENAVICO, CLEMENS PETER 1874-1929

Allergie

In Ergebnisse d. Inn. Med. und Kinderh., 1: 420-464, 1908

The author was the first to introduce the concept of allergy in tuberculosis. He devoted his life to the study of human nutrition and was responsible for the development of the children's hospital at the University, Vienna.

40 GHON, ANTHON, 1866-

The Primary Lung Focus of Tuberculosis in Children

London, Churchill, 1916

The most valuable work on this subject. Ghon served as professor of pathological anatomy in Vienna and Prague.

41 RANKE, KARL ERNST 1870-1926

Primärfekt, sekundäre und tertiäre Stadien der Lungentuberkulose, auf Grund von histologischen Untersuchungen der Lymphdrüsen der Lungenpforte

In Deutsches Arch. f. klin. Med., 119: 201-269, 1916

Classification of tuberculosis based for the first time on the correlation of pathology and immunology. Ranke practised as a lung specialist in Munich, where he served also as professor of internal medicine.

42 FOWLER, (Sir) JAMES KINGSTON 1851-1934

Pulmonary Tuberculosis

London, Macmillan, 1921. Opened at pp. 120-1

First description of infraclavicular primary infiltration and of the way tuberculosis spreads along the bronchi. Fowler was Consulting Physician to Brompton Hospital. He made important contributions in the field of medical education in England.

43 CALMETTE, ALBERT 1863-1933

L'infection bacillaire et la tuberculose chez l'homme et chez les animaux 3 ed Paris, Masson, 1928

The most important work on the bacteriology and the serology of tuberculosis Calmette was one of the directors of the Paris Pasteur Institute

CASE 7

*Works on the Pathology and Physiology of Respiration,
of the Nineteenth and early Twentieth Centuries*

Prepared by I RAPPAPORT

44 FLOURENS, MARIE JEAN PIERRE 1794-1867

Recherches experimentales sur les proprietes et les fonctions du système nerveux, dans les animaux vertebres

Paris, Crevot, 1824

Flourens discovered the "vital node," the bilateral center of respiration in the medulla oblongata, a lesion of which causes asphyxia He was professor of anatomy at the University of Paris

45 JOERG, EDUARD 1808-1878

**De Morbo Pulmonum Organico, ex Respiratione \conitorum imperfecta Orto*

Leipzig, Niesu, 1832

The first description of pulmonary atelectasis and its significance in determining whether or not air has entered the lungs of a dead infant Joerg's later work was concerned with tropical diseases He spent some time in Cuba, and later on in Oleona, Pennsylvania

46 MENDELSSOHN, ARNOLDUS 1817-

Der Mechanismus der Respiration und Circulation oder das explicirte Wesen der Lungenhyperamien

Berlin, Behrs, 1845

Mendelssohn was the first advocate of the idea that atelectasis is of great importance in the origin of pneumonia

47 BERT, PAUL 1830-1866

Leçons sur la physiologie comparee de la respiration

Paris, Bailliere, 1870

This marks the beginning of the modern science of the physiology of respiration The author was professor of physiology at the Sorbonne

48 BOHR, CHRISTIAN 1855-1911

Ueber die Lungenathmung

In *Skandinavisches Arch f Phys*, 2 236-268, 1891

First modern studies of the exchange of gases in respiration Bohr was connected with the physiological laboratory at the University of Copenhagen

49 PASTEUR, WILLIAM

The Bradshaw Lecture on massive Collapse of the Lung

In Lancet, 2 1351-1355, 1908

First description of massive collapse of the lungs During the late war Pasteur served as Consultant Physician to the British Armies in France and later as Consultant Physician to the Middlesex Hospital

50 LAGUESSE, GUSTAVE EDOUARD 1861-1927, and D'HARDIVILLER, A

L'Acinus pulmonaire chez l'homme adulte (d'après une reconstitution plastique en cire) Travaux et Mémoires de l'Université de Lille, Atlas no 1

Lille, l'Université, 1910 Opened at pl 2

One of the foremost studies of the anatomy of the lung Laguesse was professor of histology at Lille D'Hardiviller, his former assistant, left Lille for Amiens, where for a time he taught histology He practises medicine there at the present time

51 HENDERSON, LAWRENCE JOSEPH, 1878-

Blood, a study in general Physiology

New Haven, Yale Univ pr, 1928

Most important book written on the subject of the function of respiration The author is professor of biological chemistry at Harvard University

CASE 8

*Important Contributions to our Knowledge of Pneumonia,
Hay fever, Asthma, and other Diseases
of the Respiratory Tract*

Prepared by I RAPAPORT

52 STOKES, WILLIAM 1804-1878

A Treatise on the Diagnosis and Treatment of Diseases of the Chest

Phila, Waldie, 1837

The greatest nineteenth century English treatise on diseases of the lung It includes the first observation on the beneficial effect of pneumothorax in phthisis Its discussion of emphysema and bronchiectasis is still unsurpassed Stokes was Regius professor of medicine in Dublin University For a long time he was the undoubted head of his profession in Ireland

53 FLINT, AUSTIN 1812-1886

Physical Exploration and Diagnosis of Diseases affecting the respiratory Organs

Phila, Blanchard & Lea, 1856 Opened at p 197

Flint was the best clinical student of pulmonary tuberculosis that America had so far produced. He added the term broncho-vesicular breathing. One of the most eminent American practitioners of his century, he was President of The New York Academy of Medicine in 1873.

54 FRAENKEL, ALBERT 1848-1916

Spezielle Pathologie und Therapie der Lungenkrankheiten

Berlin & Wien, Urban & Schwarzenberg, 1904

The most important textbook on diseases of the lung of a generation ago

55 BARD, JOHN 1716-1799

An Essay on the Nature and Cause of y^t malignant Plurisy [sic]

MS New York, January, 1749

An able practitioner of colonial New York and Philadelphia, John Bard was the father of the more noted Samuel Bard. This manuscript was not published until after the author's death.

56 VIRCHOW, RUDOLF 1821-1902

Die Verstopfung der Lungenarterie und ihre Folgen

In Beitrage zur exp Path und Phys, h.2 1-90, 1846

Virchow was the first to recognize pulmonary embolism. He also discovered sarcinic and aspergillic forms of mycosis in the lungs and bronchial tubes. He showed the true relationship between lupus and tuberculosis.

57 ROKITANSKY, CARL 1804-1878

A Manual of pathological Anatomy

Phila, Blanchard & Lea, 1855 Opened at vol 4, p 65

He was the first to differentiate between lobar and lobular pneumonia. He also described and defined the bronchitic and pulmonary complications of typhoid as bronchotyphus and pneumotyphus. He was professor of pathological anatomy at Vienna.

58 FRAENKEL, ALBERT 1848-1916

Ueber die genuine Pneumonie

In Verh Kongr inn Med, 3 17-31, 1884

Report of the discovery of the pneumococcus as the cause of pneumonia. Fraenkel was assistant to Kussmaul and Traube at Leyden. He became professor of internal medicine and Director of the Medical Department of the Stadt Krankenhaus am Urban, Berlin.

- 59 AVERY, OSWALD THEODORE, CHICKERING, HENRY THORNDIKE, COLLE, RUFUS IVORY, and DOCHETZ, ALFRED RAYMOND

Acute lobar Pneumonia Prevention and Serum Treatment Monograph no 7 of the Rockefeller Institute for Medical Research

N Y, 1917

This embodies the results of the investigations of the workers at the Rockefeller Institute into the groups of pneumococci and the serum treatment of lobar pneumonia. It is the most valuable research on the subject.

- 60 SALTER, HENRY HYDE 1823-1871

On Asthma its Pathology and Treatment

London, Churchill, 1860. Opened at pp 310-1

First description of asthma due to hypersensitiveness. Salter was professor of physiology at Charing Cross Hospital. He suffered all his life from asthma.

- 61 VIDAL, GEORGES FERNAND ISIDORE 1862-1929, LENOIR, MARCEL 1858-1929, ABRAMI, PIERRE 1879- , BRISSAUD, LIEVIN 1892- , and JOLIVAIN, EDOUARD 1879-

Les phénomènes d'ordre anaphylactique dans l'asthme. La crise hémoclasique initiale.

In La presse médicale, 22 525-527, 1914

The first description of the relationship between anaphylactic shock and asthma. Vidal has been called the standard bearer of French medicine. He was clinical lecturer at the Hôpital Cochin, and possessed remarkable gifts for research and clinical work.

- 62 BLACKLEY, CHARLES HARRISON 1820-1900

Hay Fever its Causes, Treatment, and effective Prevention

2 ed London, Bullière, Lindall, & Cox, 1880

First experimental demonstration of pollen hypersensitiveness. Blackley practised as a homoeopathist in Winchester, England. He was a great enthusiast about botany, microscopy and chemistry.

- 63 GREENHOW, EDWARD HENSLAY 1814-1888

Specimen of Concomitant black Lung

In Path Soc London, 16 60-61, 1865

First report of the finding of silica in miner's phthisis. The author was a physician and lecturer on public health at St Thomas's Hospital, London. He was one of the founders and an early president of the Clinical Society there.

64 JENNER, (SIR) WILLIAM 1815-1898

Emphysema of the Lungs

In *A System of Medicine*, edited by J Russell Reynolds, London & N Y, 1871, 3 475-511

The large-lunged emphysema of Jenner, also termed substantive or idiopathic, is a well-marked affection Jenner also described atrophic emphysema as small-lunged A Fellow of the Royal College of Physicians, he served as professor of clinical medicine at the University College Hospital, London, and was physician to the Queen and to the Prince of Wales

65 SICARD, JEAN ATHANASE 1872-1929, and FORESTIER, JACQUES

Methode generale d'exploration radiologique par l'huile iodee (lipiodol)

In *Bull et mem de la Soc med des hop de Paris*, 3 s 46 463-469, 1922

Report of the first use of lipiodol in x-ray of the bronchial tubes Sicard occupied the chair of medicine at the Faculte de Medecine de Paris Forestier is now in practice at Aix-les-Bains, France

CASES 9 AND 10

*Important Developments in Lung Surgery made during
the Nineteenth and early Twentieth Century*

Prepared by F B BERRY

66 POUTEAU, CLAUDE 1725-1775

Oeuvres posthumes

Paris, Pierres, 1783 Opened at vol 1, p 323

Earliest description of operation for abscess of lung and recognition of protective value of adhesions between parietal and visceral pleurae Pouteau was one of the most celebrated surgeons of his time

67 LAPREY, DOMINIQUE JEAN (le baron) 1766-1842

Memoire sur les plaies penetrantes de la poitrine

In *Mem de l'Acad roy de med*, 1 221-250, 1828

Truimatic surgery of the chest, one hundred years ago The eminent surgeon, Larrey, served as Surgeon-in-chief to Napoleon's great army

68 REVIEW OF WAR SURGERY AND MEDICINE Prepared in the Office of the Surgeon General

Washington, 1918-1919 Opened at vol 1, no 4

This monograph on "War Wounds of the Lung" shows the modern concepts of traumatic surgery of the chest

69 LAW, ROBERT 1800-1875

Cases of putrefactive Disorganization of the Lungs

In Dublin Med Tr, n s 1 89-104, 1830

An early description of gangrene of the lung The author was physician to Sir Patrick Dun's Hospital, Dublin, and professor of the institutes of medicine there

70 HUGHES, HENRY MARSHALL 1805-1858, and COCK, EDWARD 1805-1892
On Paracentesis Thoracis, with Cases

In Guy's Hosp Rep, 2 s 2 18-104, 1844

The earliest form of closed drainage for empyema This was practised contemporarily by Trousseau in France, and first described in America by H I Bowditch, Boston, 1852 Hughes was physician to Guy's Hospital, and Cock was surgeon there

71 ESTLANDER, JAKOB AUGUST 1831-1881

Encore quelques mots sur la resection des cotes dans l'empyème chronique

In Rev mens de Med et de Chir, 3 885-888, 1879

Estlander first advocated multiple rib resections for chronic empyema This contains the first report of the operation The author was professor of surgery at Helsingfors

72 DE CERENVILLE, EDOUARD 1843-1915

De l'intervention opératoire dans les maladies du poulmon

In Rev méd de la Suisse romande, 5 141-167, 1885 Opened at p 443

Earliest description of thoracoplastic operations for closure of cavities in chronic pulmonary tuberculosis The author was professor of clinical medicine at the University of Lausanne

73 TRUC, HERMENTAIRE 1857-1929

Essai sur la chirurgie du poulmon dans les affections non traumatiques

Paris, Baillière, Alcan, 1885 Opened at p 33

An early discussion of surgery of the lung 1) Pneumectomy, 2) Intrapulmonary injections, 3) Pneumotomy Truc abandoned his early interest in surgery and turned to ophthalmology He became professor of the latter at Montpellier This volume was lent through the courtesy of the Army Medical Library

74 DELORME, EDMOND 1847-1929

Du traitement des empyèmes chroniques par la decortication du poulmon

In Gaz d hop, 69 1445-7, 1453-6, 1896

The first description of decortication of lung for cure of chronic empyema Delorme was professor of clinical surgery at Val-de-Grâce

75 TUFFIER, THEODORE 1857-1929

Chirurgie du poumon en particulier dans les cavernes tuberculeuses et la gangrene pulmonaire

Paris, Masson, 1897

Earliest monograph on the surgery of the lung Tuffier made a specialty of lung diseases and stomach trouble He did remarkable work in the treatment by anaesthesia with cocaine injections into the rachidean canal

76 BRAUER, LUDOLPH 1865- , and FRIEDRICH, PAUL LEOPOLD, 1864-1916
Über Lungenchirurgie

In Verhandl d Gesellsch deutsch Naturf u Aerzte, 1908, 80
Versamml pt 2 166-186, 1909

Early advocates of collapse therapy in chronic pulmonary tuberculosis, both by pneumothorax and extrapleural thoracoplasty Brauer is professor of internal medicine at Hamburg and director of the Krankenhaus Hamburg-Eppendorf

77 MEYER, WILLY 1858-1932

Pneumectomy with the Aid of differential Air Pressure an experimental Study The new Type of Apparatus used

In J A M A, 53 1978-1987, 1909

Pioneer work in America on pneumectomy and differential pressure anaesthesia The development of thoracic surgery in this country owes much to Meyer He founded the N Y Society for Thoracic Surgery and the American Association for Thoracic Surgery

78 SAUERBRUCH, FERDINAND 1875- , and SCHUMACHER, EMIL DAGOBERT
1880-1914

Technik der Thoraxchirurgie

Berlin, Springer, 1911 Opened at p 44

The first description of paravertebral thoracoplasty for chronic pulmonary tuberculosis Sauerbruch studied under Langerhans, Mikulicz and Friedrich He is now director of the surgical clinic in the University of Berlin Schumacher was assistant in the surgical clinic at Zurich under Kroenlein

79 MELTZER, SAMUEL JAMES 1851-1920

The Method of Respiration by Intratracheal Insufflation

In Med Record, 77 477-483, 1910

First description of the intratracheal method of anaesthesia Meltzer directed the Rockefeller Institute's department of physiology and pharmacology

80 MACMAHON, CORTLANDT

Breathing and physical Exercises for Use in Cases of Wounds in the Pleura, Lung and Diaphragm

In Lancet, 2 769-770, 1915

Description of breathing and physical exercises for use in cases of wounds of pleura, lung, and diaphragm and following empyema to promote re-expansion of lung, and to prevent deformity of chest The author, not a medical man, is instructor for speech defects at St Bartholomew's Hospital

81 JACOBÆUS, HANS CHRISTIAN 1879-

Endopleurale Operationen unter der Leitung des Thorakoscops

In Beitr z Klin d Tub, 35 1-35, 1916

First description of thoracoscopy and the division of adhesions in incomplete artificial pneumothorax Thoracoscopy first described by him in 1912 He is professor of clinical medicine at the Karolinska Institutet, Stockholm

82 MACKENTY, JOHN EDMUND 1869-1931

Cancer of the Larynx

N Y, [1927] Opened at pp 56-57

One of the foremost contributions on malignant growths of the larynx Mackenty was a pioneer in laryngeal surgery His method of operation and his artificial larynx won widespread acclaim in 1927 He was surgeon to the Manhattan Eye, Ear and Throat Hospital and was a Fellow of the New York Academy of Medicine

FOR THE GENERAL PRACTITIONER

A Selection of Some of the Best Modern Books on the Respiratory System

Chosen by FRANK B BERRY and ISRAEL RAPPAPORT

ADLER, ISAAC Primary malignant Growths of the Lungs and Bronchi
N Y, Longmans, 1912

CLIFFORD, RANDALL The Sputum
N Y, Macmillan, 1932

FISHBERG, MAURICE Pulmonary Tuberculosis
Phila & N Y, Lea & Febiger, 1916

GRAHAM, EVARTS AMBROSE, SINGER, JACOB JESSE, and BALLON, HARRY
CLARENCE Surgical Diseases of the Chest
Phila, Lea & Febiger, 1935

HAMILTON, ALICE Industrial Toxicology
N Y & London, Harper, 1934

- HENDERSON, YANDELL, and HAGGARD, HOWARD WILCOX Noxious Gases
N. Y., Chemical Catalog Co., 1927
- JACKSON, CHEVALIER, and JACKSON, CHEVALIER LAWRENCE Bronchoscopy,
Esophagoscopy and Gastroscopy 3 ed
Phila & Lond., Saunders, 1934
- LETULLE, MAURICE Anatomie pathologique
Paris, Masson, 1931, vol 1, pp [634]-708, "Appareil circulatoire
E — Poumons"
- LILIENTHAL, HOWARD Thoracic surgery
Phila & Lond., Saunders, 1925
- LORD, FREDERICK TAYLOR Diseases of the Bronchi, Lungs, and Pleura
Phila & N Y, Lea & Febiger, 1925
- MILLER, JAMES ALEXANDER "Diseases of the respiratory Tract," in *Internal
Medicine* edited by John H Musser 2 ed
Phila., Lea & Febiger, 1934, pp 688-805
- NELSON NEW LOOSE-LEAF MEDICINE
N Y, Nelson, [1932], vol 3, pp 385-580, "Diseases of the respiratory
System"
- NORRIS, GEORGE WILLIAM, and LANDIS, HENRY ROBERT MURRAY Diseases of
the Chest
Phila & Lond., Saunders, 1933
- PANCOAST, HENRY KHUNRATH, and PENDERBORASS, EUGENE PERCIVAL Pneu-
moconiosis [silicosis]
N Y, Hoeber, 1926
- RACKEMANN, FRANCIS MINOT Clinical Allergy
N Y, Macmillan, 1931
- SANTE, LE ROY The Chest roentgenologically considered, vol 11 of *Annals
of Roentgenology*, 1930
- WESSLER, HARRY, and JACHES, LEOPOLD Clinical roentgenology of Diseases of
the Chest
Troy, N Y, Southworth, 1923
- WINGFIELD, RUDOLPH CHARLES A Text-book of pulmonary Tuberculosis for
Students
London, Constable, 1929
-

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- Addams, J My friend, Julia Lathrop
N Y, Macmillan, 1935, 228 p
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Wash, Amer Pharm Assoc, 1935, 556 p
- Anderson, A von K Essentials of physiological chemistry
N Y, Wiley, 1935, 257 p
- Austria Bundesministerium fur soziale Verwaltung Wiener allgemeines
Krankenhaus
Innsbruck, Tyrolia-Verlag, [1935], 130 p
- Bernou, A E M & Fruchaud, H Chirurgie de la tuberculose pulmonaire.
Paris, Doin, 1935, 596 p
- Boyd, E The growth of the surface area of the human body
[Minneapolis], Univ of Minn Press, 1935, 145 p
- Brackenbury, (Sir) H B Patient and doctor
London, Hodder, [1935,] 280 p
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London, Allen, [1935], 215 p
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Bologna, Zanichelli, 1935, 142 p
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London, Arnold, [1935], 192 p
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N Y, Oxford Univ Press, [1935], 373 p
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London, Churchill, 1935, 458 p
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Paris, Vigot, 1935, 553 p
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Munchen, Lehmann, 1935, 113 p
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Paris, Le François, 1935, 216 p
- Fischer, A *Pneumothoraxtherapie in der taglichen Praxis*
Wien, Weidmann, [1935], 195 p
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London, Arnold, 1935, 470 p
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Berlin, Urban, 1935, 568 p
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Edin, Blackwood, [1935], 282 p
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Cambridge [Eng], Univ Press, 1935, 246 p
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Berlin, Springer, 1935, 625 p

- Langenbeck, W Die organischen Katalysatoren und ihre Beziehungen zu den Fermenten
Berlin, Springer, 1935, 112 p
- Lehrbuch der Nerven- und Geisteskrankheiten, hrg von W Weygandt
Halle a S, Marhold, 1935, 663 p
- Macdonald, G A G & Hargrave-Wilson, W The osteopathic lesion
London, Humeann, 1935, 141 p
- McDonnell, J A doctor talks
London, Newnes, [1935], 126 p
- McLester, J S The diagnosis and treatment of disorders of metabolism
N Y, Oxford Univ Press, [1935], 328 p
- von Magyary-Kossa, J Ungarische medizinische Erinnerungen
Budapest, Danubia Verlagsanstalt, 1935, 368 p
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London, Hutchinson, 1935, 302 p
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London, Murray, [1935], 45 p
- Meullat, L A & Campbell, D M Veterinary military history of the United States
Chic, Veterinary Magazine Corp, 1935, 2 v
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London, Bailliere, 1935, 64 p
- Morris, R T Fifty years a surgeon (Omitted by mistake, Feb, 1935)
N Y, Dutton, 1935, 346 p
- Muller, M Prognose und Therapie der Geisteskrankheiten
Leipzig, Thieme, 1936 [1935], 164 p
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Paris, Masson, 1935, 340 p
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London, Bailliere, 1935, 92 p
- Pharmacopoeia (The) of the United States 11 decennial revision
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- Rehfuess, M E & Nelson, G M The medical treatment of gallbladder disease
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London, Arnold, [1935], 218 p
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Wien, Springer, 1935, 232 p
- Schlossmann, H & Wassermann, F *Grundriss der pathologischen Physiologie der Pharmakologie und Toxikologie* 8 Aufl
München, Müller, 1935, 366 p
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London, Milford, 1935, 382 p
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London, Chapman, [1935], 208 p
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London, Allen, [1935], 692 p
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N Y, Modern Medical Press, [1935], 96 p
- Wolters, X F M G *Notes on antique folklore on the basis of Pliny's Natural history*
Amsterdam, Paris, 1935, 150 p

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- Auei, K Atlas der Anatomie des Kopfes 2 Aufl
Munchen, Reichsverband deutscher Dentisten, [1935], 267 p
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- Beaman, A G A doctor's Odyssey, a sentimental record of Le Roy Crummer
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- Bercher, J, Farguin-Fayolle, P, de Fleury, P L E M [et al] Pathologie
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textbook
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- Buhlei, (Fiau) C (Malachowski) & Hetzer, H Testing children's develop-
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N. Y., Prentice-Hall, 1935, 268 p
- Forsyth, D. Psychology and religion
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- Freud, S. A general introduction to psycho-analysis
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N. Y., Harcourt, 1935, 720 p
- Kowarschik, J. Kurzwellentherapie
Wien, Springer, 1936, 140 p
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Balt., Wood, 1935, 330 p
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- Lord, F. F. & Heffron, R. Lobar pneumonia and serum therapy
N. Y., Commonwealth Fund, 1936, 91 p
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- Mckie, D. Antoine Lavoisier, the father of modern chemistry
London, Gollancz, 1935, 303 p
- Meyer, W. Normal histology and histogenesis of the human teeth
Phil., Lippincott, [1935], 305 p
- Modern home medical adviser. Edited by M. Fishbein
Garden City, Doubleday, 1935, 905 p

- Monroe, M Children who cannot read
 Chic, Univ of Chic Press, [1935], 205 p
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 Bristol, Wright, 1935, 367 p
- Moses Maimonides Anglo-Jewish papers in connection with the eighth
 centenary of his birth
 London, Soncino Press, [1935], 248 p
- Parsons, I R Fundamentals of biochemistry 5 ed
 Cambridge, Eng, Heffer, [1935], 453 p
- Paulian, D E Tumeurs de l'encephale
 Paris, Masson, 1935, 213 p
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 London, Duckworth, [1935], 400 p
- Perry, R B The thought and character of William James
 Boston, Little, 1935, 2 v
- Rademaker, G G J Reactions labyrinthiques et equilibre
 Paris, Masson, 1935, 262 p
- Reichenbach, E Leitfaden der Kieferbruchbehandlung
 Leipzig, Meusser, 1935, 133 p
- Riggs, A F Play, recreation in a balanced life
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- Sabrazès, J E & Saric, R Angines lympho-monocytaires, agranulocytoses,
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- Samuels, S S The diagnosis and treatment of diseases of the peripheral
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- Schnell, W Luftfahrtmedizin
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- Schultz, J H Neurose, Lebensnot, ärztliche Pflicht
 Leipzig, Thieme, 1936, 125 p
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- Shennan, T Post mortems and morbid anatomy 3 ed
 London, Arnold, 1935, 716 p
- Small, V R I knew 3000 lunatics
 London, Rich, [1935], 273 p
- Stevenson, R S Recent advances in laryngology and otology
 London, Churchill, 1935, 346 p
- Stimson, P M A manual of the common contagious diseases 2 ed
 Phil, Lea, 1936, 437 p
- Suttie, I D The origins of love and hate
 London, Paul, 1935, 275 p
- Thurstone, L L The vectors of mind
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- White, W A Twentieth century psychiatry
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- Williams, L L B Minor medical mysteries
London, Cassell, [1935], 211 p

PROCEEDINGS OF ACADEMY MEETINGS

FEBRUARY

STATED MEETINGS

Program arranged in cooperation with the SECTION OF SURGERY—February 6

- I EXECUTIVE SESSION—*a* Reading of the minutes *b* Election of Members

SCIENTIFIC PROGRAM

- II PRESENTATION OF CASES—*a* 1 Diverticulitis with phlegmon of the sigmoid 2 Ulcerating carcinoma of colon with adenitis Five and a half years after operation A Lightstone
b Radiation therapy as a selective method of treatment for rectal cancer Two cases George E Binkley *c* Adenocarcinoma of the rectum with ball valve colostomy ten years after operation by electrosurgery George A Wyeth
- III PAPERS OF THE EVENING—*a* Diverticulitis of the colon Carl Eggers *b* The more recent advances in the treatment of carcinoma of the sigmoid and rectum Daniel F Jones Boston (by invitation)

IV GENERAL DISCUSSION

- V EXECUTIVE SESSION—SECTION OF SURGERY

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)

February 20

THE FIFTH HARVEY LECTURE The Interrelation of Cerebrum and Cerebellum in the Regulation of Somatic and Automatic Functions John Farquar Fulton Sterling Professor of Physiology Yale University

This lecture takes the place of the second Stated Meeting of the Academy for February

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY—February 4

- I READING OF THE MINUTES
- II PRESENTATION OF CASES—*a* Mt Sinai Hospital *b* Miscellaneous Cases
- III DISCUSSION OF SELECTED CASES

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COMBINED MEETING OF SECTION OF NEUROLOGY AND PSYCHIATRY and SECTION OF ORTHOPEDIC SURGERY—February 11

- I PAPERS OF THE EVENING—*a* Neurological aspects of so called sciatic pain Byron Stookey (Lantern slides) Discussion Angus Frantz *b* Paravertebral nerve block in rehabilitation and for the relief of pain in the back and extremities M B Greene Discussion Charlton Wallace Everett A Tyler Phila (by invitation) *c* Experiences with fasciotomy for the relief of low back and so called sciatic pain Alan de Forest Smith Discussion Leo Mayer Lewis C Wagner Mather Cleveland Philip D Wilson

SECTION OF PEDIATRICS—February 13

- I PAPERS OF THE EVENING—*a* Clinical experience with crystalline vitamin D The influence of menstruum on the effectiveness of anti rachitic factor Jacques M Lewis *b* Mortality in tuberculin positive infants Miriam Brailey The Johns Hopkins Hospital (by invitation)
- II DISCUSSION—Mr Godias J Drolet (by invitation) Herbert R Edwards Camille Kereszturi Charles H Smith Benjamin Kramer

SECTION OF OPHTHALMOLOGY—February 17

- INSTRUCTIONAL HOUR 7 00 8 00 Bernard Samuels—The pathology of glaucoma
- SLIT LAMP—Demonstration of cases 7 30 8 30 Milton L Berliner Girolamo Bonaccalto Gordon M Bruce Wendell L Hughes

SCIENTIFIC PROGRAM

- I READING OF MINUTES
- II REPORT OF COMMITTEE TO NOMINATE NEW MEMBER OF ADVISORY COMMITTEE
- III PRESENTATION OF INSTRUMENT—A new type of telescopic lens, Milton L Berliner (5 minutes)
- IV REPORT OF CASES—*a* Methylene blue staining of the eye Alexander Gerber (by invitation) Robert K Lambert Mrs E B Burchell (by invitation) *b* Complete homo keratoplasty James G Morrissey (by invitation) *c* The therapeutic value of the contact glass in keratitis e lagophthalmos & keratitis neuroparalytica Daniel M Rolett (5 minutes) (by invitation)
- V PAPERS OF THE EVENING—*a* The pathology of chronic inflammatory conditions of the cornea Bernard Samuels *b* Benzyl cinnamic ether in the treatment of trachoma and corneal opacities Jacob Jacobson Paris France (by invitation) *c* Reports of cases treated with benzyl cinnamic ether 1 Wendell L Hughes 2 Adolph Posner (by invitation) 3 Henry Skeel 4 Erwin Jessel (by invitation) 5 Ramon Castroviejo 6 Ervin Tusak

SECTION OF GENITO URINARY SURGERY—February 19

- I READING OF THE MINUTES
- II PRESENTATION OF CASE—Diverticulum of the prostatic urethra with stone J Bayard Clark
- III PAPERS OF THE EVENING—*a* Nephroptosis analysis of palliative and operative treatment in 266 cases Cyril K Church (by invitation) *b* A new operation for stricture at the ureteropelvic junction Report of cases Frederic E B Foley St Paul Minn (by invitation) Discussion Clarence Bandler Edwin Beer George Hoch Fedor Senger, Augustus Harris Dr C G L Van Dyke South Africa Henry D Furniss
- IV GENERAL DISCUSSION

SECTION OF OTOLARYNGOLOGY—February 19

- I READING OF THE MINUTES
- II PRESENTATION OF CASES—*a* Reparative processes in labyrinthitis following epidemic meningitis Joseph G Druss *b* Gradenigo Syndrome simulating an expanding intracranial lesion Walter Horn *c* Unusually early pleuro pulmonary metastasis and sinus thrombosis Harry Rosenwasser

- III PAPERS OF THE EVENING—*a* Malignancies of the nasopharynx Louis Kleinfeld *b* Complications of acute paranasal sinusitis with special reference to bacteremia Joseph L Goldman (by invitation) *c* Sphenoid sinusitis with meningitic symptoms Rudolph Kramer Max Som (by invitation) *d* Thrombophlebitis of the jugular bulb and lateral sinus of non otitic origin Important ear findings 1 Report of three cases Samuel Rosen 2 Origin and extension from throat infection Irving Goldman 3 Retrograde extension to the jugular bulb and lateral sinus Diagnosis and management Jacob L Maybaum 4 Discussion Samuel Karelitz

IV GENERAL DISCUSSION—Opened by Isadore Friesner

SECTION OF OBSTETRICS AND GYNECOLOGY—February 25

- I PAPERS OF THE EVENING—*a* A preliminary study of the histological changes in the human cervical mucosa Anthony Wollner Discussion opened by Theodore Neustaedter *b* Mechanical principles in the management of occipitoposterior positions John Mann Toronto (by invitation) Discussion opened by Howard C Moloy (by invitation) Edward H Dennen Hervey C Williamson *c* Analgesia in labor a modified Gwathmey technique (with moving picture) Charles O McCormick Indianapolis Associate Professor of Obstetrics Indiana University School of Medicine (by invitation) Discussion opened by James T Gwathmey James A Harrar (by invitation)

II GENERAL DISCUSSION

NOTICE SECTION OF ORTHOPEDIC SURGERY—The meeting of the Section of Orthopedic Surgery was not held on the regular date as the section held a combined meeting with the Section of Neurology and Psychiatry on February 11th

AFFILIATED SOCIETIES

NEW YORK ROENTGEN SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE

JOINT MEETING WITH THE NEW YORK GASTROENTEROLOGICAL SOCIETY—February 17

I PRESENTATION OF INTERESTING CASES

- II PAPERS OF THE EVENING—*a* Effects of various types of foodstuffs on gastrointestinal motility *b* Partial observations on gastrointestinal manifestations in hyperthyroidism Eugene P Pendergrass Philadelphia (by invitation)

III DISCUSSION—Opened by Lewis Gregory Cole Burrill B Crohn

IV EXECUTIVE SESSION

COMBINED MEETING OF NEW YORK PATHOLOGICAL SOCIETY AND THE SECTION OF MEDICINE

February 18

SYMPOSIUM ON ETIOLOGY OF NEOPLASMS

- I HEREDITARY FACTORS—Clara J Lynch (30 minutes) (by invitation)
 II CHEMICAL FACTORS—Francis Carter Wood (30 minutes)
 III BIOLOGICAL ASPECTS—James B Murphy (30 minutes) Discussion (5 minutes each)
 Halsey J Bagg (by invitation) Jacob Furth James Ewing

NEW YORK MEETING OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of THE NEW YORK ACADEMY OF MEDICINE—February 19

- I Some effects of pentobarbital on the rabbit S N Blackberg M C Hrubetz (Introduced by C C Lieb)
 II Studies on vasomotor reflexes Vasoconstriction from a deep inspiration of air C C Lieb M G Mulinos H L Taylor
 III Hyperproteinemia with reversal of the albumin globulin ratio in lymphogranuloma inguinale R D Williams A B Gutman (Introduced by R F Loeb)
 IV Inulin and its suitability for intravenous administration in man W Goldring H W Smith
 V Function of pituitary grafts in mice R T Hill W U Gardner (Introduced by E Allen)
 VI Local uterine growth in untreated ovariectomized rabbits S R M Reynolds S Kaminester
 VII Electrocardiographic changes following coronary sinus occlusion in the dog's heart L Gross A M Master G Silverman
 IX X ray absorption coefficients of coronal and root dentin F Hollander E Vesely

MEMBERS ELECTED—JANUARY 2, 1936

Rudolph Aebli
 Frederick Henry Amendola
 Robert Stanley Bickley
 Ramon Castroviejo
 Chester Oliver Davison
 Thomas Francis Duhigg
 Samuel Budd English
 Emanuel Zachary Epstein
 Martin A Furman
 Frank Glenn
 Charles Kemm Good
 Loren Pritchard Guy
 Thomas Francis Howley
 Sheldon Albert Jacobson
 Herbert Robert Kenyon
 Samuel Harold Klein
 Olga Knopf
 John A Lawler, Jr
 Andrew Anthony Marchetti
 Peter Marshall Murray
 Emery Andrew Rovenstine
 Nathan Sobel
 Irving Somach
 Abraham Bernard Tamis
 Annis Evelcen Thomson
 Edwin Anthony Tusak
 James Leonard Vickers
 Bettini Warburg
 Leo Wilson
 Fritz Siegfried Wittels
 Walter Franz von Zelinski

30 East 40 Street
 667 Madison Avenue
 2 East 70 Street
 635 West 165 Street
 1 Fulton Court, Poughkeepsie
 641 Washington Street
 Glen Gardner, N J
 1127 Park Avenue
 142 West 87 Street
 525 East 68 Street
 2 East 54 Street
 116 East 62 Street
 440 West 34 Street
 1919 Madison Avenue
 2 East 54 Street
 17 East 96 Street
 315 East 68 Street
 115 East 61 Street
 333 East 53 Street
 2588 Seventh Avenue
 477 First Avenue
 200 West 59 Street
 71 East 87 Street
 240 East 175 Street
 30 Madeline Plwy, Yonke
 115 East 90 Stre
 Maple Ave, Greenwich,
 23 East 74 St
 1015 Gerard A
 91 Central Park
 c/o Surgeon General, Washington

MEMBERS ELECTED—FEBRUARY 6, 1936

Raymond Bernard Allen
 Harold George Wolf

303 East 20 Street
 525 East 68 Street

OBITUARY CHARLES ALFRED BALLANCE 1856 1936

A colorful personality and a distinguished figure in English medicine and surgery has been removed by the death of Sir Charles Ballance on February 9, 1936, in the eightieth year of his age

Charles Alfred Ballance began his medical studies in the school of St Thomas's Hospital as a member of London University in 1875. He was known as a brilliant student and on his graduation in 1881 and 1882 received the degrees of B M, B S and M S with first class honours and gold medals.

During the years of undergraduate study he developed a passion for research which was to dominate his professional career and which continued during his entire life even after his active work as a surgeon had ended.

Soon after graduation he was appointed Assistant Aural Surgeon to St Thomas's Hospital and afterwards Assistant Surgeon to the West London Hospital. In the early years of his professional career he was greatly interested in diseases of the ear and he was one of the first to perform the complete mastoid operation with ligation of the jugular vein and drainage of the lateral sinus. Ballance never lost his interest in otology, and many years later published two volumes on the anatomy and surgery of the temporal bone. His last experimental research was done in this country in association with Arthur B. Duval on the surgical treatment of facial paralysis.

In 1891, he was appointed on the staff of the Hospital for Paralyzed and Epileptic in Queen Square, London. There he met a kindred spirit in Victor Horsley, and developed a great interest in the surgery of the nervous system. Like Horsley, he frequented the physiological laboratory and his enthusiasm for laboratory research never diminished. His interests were greatly diversified as shown by the variety of subjects which he studied. Alone or with collaborators he published papers and books on a large number of topics: on the ligation of arteries (1889), on nerve anastomosis and nerve grafting (1902), on surgery of the heart (1919), on surgery of the brain (1921), on surgical treatment of paralysis of the vocal cord and of the diaphragm (1927). For several years he made an intensive study of parasitic protozoa, hoping thus to discover the etiology of malignant disease.

Ballance was a man of wide reading and of many interests, and his life was a busy one. As a surgeon he was a very slow and deliberate operator, scrupulously conscientious in his work at the operating table as in the laboratory. His sincerity and enthusiasm gained him many admirers and friends among his colleagues at home and abroad. They were proud to honor him.

He was President of the Medical Society of London, and Vice-President of the Royal College of Surgeons, Consulting Surgeon to St. Thomas's Hospital and to the National Hospital, Queen Square. At the age of thirty-three, he delivered the Erasmus Wilson Lecture on ligation of arteries, and in succeeding years, the Bradshaw Lecture on surgery of the heart, the Vicary Lecture on the history of surgery of the brain, the McEwen Lecture in Glasgow, and the Lister Memorial Lecture in London. He received honorary degrees from the Universities of Glasgow and of Malta, and after serving in the near East as consulting surgeon during the War, he was knighted.

When the Society of British Neurological Surgeons was formed in 1927, he was elected its first president, and at the inaugural meeting of that Society, he held his audience enthralled by his reminiscences of the great figures which had played a part in the development of neurological surgery.

In 1933, he was elected an Honorary Fellow of The New York Academy of Medicine.

Sir Charles was a Victorian who was proud that he had lived in the times of Ferriar, Horsley, Gowers, Sherrington and Cushing, to mention only a few names, and he greatly admired all of them. He had a genial personality and a fine presence, and even at an advanced age his enthusiasm for and sincerity in his work were undiminished. At the age of seventy-five years, he was in this country to do, with Dr. Dnel, important experimental research on the surgical treatment of facial paralysis, and his enthusiasm and energy greatly impressed all who came in contact with him. He

had an impelling drive to search for truth, and this and his accomplishments ensure him of a niche in the Hall of Fame

CHARLES A. ELSBERG

DEATHS OF FELLOWS AND HONORARY FELLOWS OF THE ACADEMY

BALLANCE, SIR CHARLES (ALFRED), KCMG, CB, MVO, LL.D., M.S., F.R.C.S., Greencroft Gardens 82, Homestead N.W. 6, London, England, elected an Honorary Fellow of the Academy March 2, 1933, died February 10, 1936

CRAIG, C. BURNS, M.D., 10 Gracie Square, New York City, graduated in medicine from Western Reserve University in 1911, elected a Fellow of the Academy April 19, 1922, died February 24, 1936. At the time of his death, Dr. Craig was clinical professor of neurology at the College of Physicians and Surgeons and associate director of the Neurological Institute. He was consultant neurologist to the Rockland State Hospital, the Fordham Hospital and the Paterson General Hospital. Dr. Craig was a Fellow of the American Medical Association, and a member of the State and County Medical Societies, the American Neurological Association and the Association for Research in Nervous and Mental Disease. He served the Academy as Secretary and Chairman of the Section of Neurology and Psychiatry from 1933 to 1935, as a member of the Committee on Medical Education since 1933 and as a member of the Library Committee since May 1935. Dr. Craig contributed many articles to medical books and journals on neurological subjects. During the world war he served with the American Ambulance Corps in France, 1914-1915, in the Surgeon General's office in Washington, 1917-1918, with the 77th Division in this Country and in France and with the headquarters of the Second Army, A.E.F.

DENCH, EDWARD BRADFORD, Ph.D., M.D., Hotel Gotham, New York City, received the degree of Bachelor of Philosophy from Yale University in 1883 and was graduated in medicine from the College of Physicians and Surgeons in 1885, elected a Fellow of the Academy March 13, 1890, died February 21, 1936. Dr. Dench was consultant otologist to St. Luke's Hospital and the New York Eye and Ear Infirmary. For some time he was professor of otology in the New York University and Bellevue Hospital Medical College. He was president of the New York Otological Society 1904-1908 and of the New York Clinical Society in 1909, a Fellow of the American College of Surgeons and the American Medical Association, an honorary member of the Royal Society of Medicine and the Austrian Otological Society, and a member of the American Laryngological, Rhinological and Otological Society and the County and State Medical Societies.

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MATTHEWS, FRANK STUART, B S, M D, 49 West 52 Street, New York City, received his degree of Bachelor of Science from Washington and Jefferson College in 1890 and graduated in medicine from the College of Physicians and Surgeons in 1893, elected a Fellow of the Academy May 9, 1904, died February 17, 1936 Dr Matthews was for more than twenty years an attending surgeon to St Luke's Hospital He was also attending surgeon to St

Francis Hospital and St Mary's Free Hospital for Children and consulting surgeon to the Lawrence Hospital and the Hospital for Ruptured and Crippled He was at one time clinical professor of surgery at the College of Physicians and Surgeons In 1922, the honorary degree of LL D was conferred upon him by Washington and Jefferson College He was a Fellow of the American College of Surgeons and the American Medical Association, and a member of the American Surgical Association, the New York Surgical Society and the County and State Medical Societies

PAVLOV, ILYA PETROVICH, M D, Leningrad, Russia, graduated in medicine from the University of St Petersburg and the Military Academy of Medicine, elected an honorary member of the Academy February 4, 1904, died February 27, 1936

QUINTARD, EDWARD, M D, 1060 Fifth Avenue, New York City, graduated in medicine from the College of Physicians and Surgeons in 1887, elected a Fellow of the Academy May 5, 1891, died February 12, 1936 Dr Quintard was vice-president, professor of medicine, and medical director of the New York Post-Graduate Medical School and Hospital from 1900-1920 He was a member of the County and State Medical Societies, a Fellow of the American College of Physicians, the American Medical Association, the Congress of Internal Medicine and the Harvey Society Dr Quintard belonged to a number of literary societies and was the author of many sonnets and essays

ROTHSCHILD, MARCUS ADOLPHUS, B A, M D, 930 Park Avenue, New York City, graduated in medicine from the College of Physicians and Surgeons in 1911, elected a Fellow of the Academy December 29, 1925, died February 16, 1936 Dr Rothschild was staff physician and president of the Medical Board of Beth Israel Hospital, cardiologist to the Broad Street-Pan American Hospital, clinical professor of medicine at New York University College of Medicine and consulting physician to the French Hospital He was president-elect of the Medical Society of the County of New York, Fellow of the American Medical Association, a member of the American Association of Pathologists and Bacteriologists, the American Chemical Society, the Harvey Society, the American Heart Association, the American Society for the Advancement of Clinical Investigation and the American Society for the Advancement of Science He was the author of numerous books and papers on pathology and clinical medicine

STEESE, EDWIN STURTEVANT, M D, 75 East 55 Street, New York City, graduated in medicine from Harvard University School of Medicine in 1893, elected a Fellow of the Academy March 17, 1904, died February 7, 1936 Dr Steese was a Fellow of the American Medical Association and a member of the County and State Medical Societies

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL 12

MAY, 1936

No 5

SYMPOSIUM ON THE SIGNIFICANCE OF BLOOD SUGAR*

INTRODUCTORY REMARKS OF THE CHAIRMAN

H O MOSENTHAL
New York

Members of the Section of Medicine, members of the New York Diabetes Association, and guests

A brief survey of the purpose of this symposium may not be out of order

Every doctor treating diabetes patients is constantly confronted with the question "What is the ideal blood sugar level?" There are some facts in regard to blood sugar about which we are well informed, there are others, however, concerning which we are ignorant

We know the normal figures for blood sugar and also that in many older persons the blood sugar concentration often exceeds the accepted normal averages, it is also appreciated that in many cases of diabetes under careful insulin treatment the blood sugar fluctuates a great deal and may not be under satisfactory control at certain times of the day, especially in the morning

What we do not know is how the level of the blood sugar in itself, apart from glycosuria or acidosis, affects human beings. Does a high concentration of sugar in the blood favor bacterial growth and the occurrence of infectious diseases? Is hyperglycemia responsible for the rapid development of vascular changes so often found in diabetes? What effect has an elevated blood sugar upon the nutrition of the tissues such as the heart muscle?

* Presented at a Combined Meeting of the Section of Medicine and the New York Diabetes Association, January 21, 1936

Clinicians are eagerly awaiting an answer to these problems so that the objectives of treatment in diabetes may be more clearly defined

There are in this country no scientists or clinicians better qualified than the three essayists of the evening, to inform us upon these questions and it is with genuine pleasure and anticipation that we welcome our guest speakers

THE EFFECTS OF CARBOHYDRATES ON BACTERIAL GROWTH AND DEVELOPMENT OF INFECTION

STANHOPE BAYNE-JONES
New Haven

There are two parts to the title of my paper and I shall use the liberty presented by that title to deal with the two parts separately, and then try to bring some of this knowledge together and indicate possible conclusions. I may say at the start that while we know a great deal about the effect of carbohydrates upon bacterial growth in test tubes, we know relatively little about the processes of infection and resistance. There is even less information about the effect of various concentrations of carbohydrates upon the functions of the cells concerned in opposing bacterial growth in tissues. It will be difficult, therefore, to indicate the practical bearings of this incomplete knowledge or to describe the definite relationships of all the parts.

If you will permit me to do so, I will review, for those who are not working in the bacteriological field, some of the things with which the bacteriologist is concerned when he studies the effects of carbohydrates upon the growth of bacteria.

Multiplication of organisms is usually regarded as the evidence of growth. For practical purposes, little misunderstanding will occur if increase in numbers of cells of the normal size is taken as the definition of growth. Nevertheless, this definition may at times be faulty. From a number of years of study of motion pictures and calorimetric observations of bacterial cultures I know that multiplication

tion by continued subdivision of cells may occur with little or no increase in the bulk of bacterial protoplasm. Hence it is essential to recognize that the true criterion of growth is increase in the mass of bacterial substance.

Growing bacteria have two chief metabolic processes. One is the structural process, the other is the energy exchange. In these respects bacteria are very much like animal cells. They require relatively small amounts of nitrogen for their structural processes, but require a large amount of combustible material, usually carbohydrate, for their energy needs. When bacteria have the opportunity to get energy from easily combustible carbohydrates, they use sugars in preference to proteins in the medium. The general rule of protein sparing action of carbohydrates applies to bacterial cultures as it does to animal metabolism.

The presence of a fermentable carbohydrate in a medium greatly influences the initial growth, development and fate of a bacterial culture. As is well known, for example, media unfavorable to the pneumococcus will support the growth of this organism if dextrose is present. Avery's medium, used during the war as a substitute for the white mouse, is a typical case. Many others might be cited. Arguing by analogy for these known effects, many persons have supposed that the increased concentration of sugar in the blood and possibly in the tissues in diabetics provided unusually favorable media for bacterial growth and hence aided infection.

I fail to see that this is directly applicable. Most of the media which are rendered more favorable for bacterial growth by the addition of carbohydrate are primarily incapable of supporting more than a feeble development of the organisms. On the other hand, blood and tissues are in themselves such favorable media that the addition of carbohydrate to them can have relatively little effect. That this is so has been shown by a number of experiments, the results of which disclosed that blood to which 0.1 to 0.5 per cent dextrose was added was no more suitable as a culture medium for staphylococci than the control samples without added sugar.

The end products of carbohydrate metabolism, acids, aldehydes and other substances exert unfavorable actions upon bacterial growth, limiting it or suppressing it altogether. None of these actions can come into play in the changing blood stream or tissues of a diabetic.

The effects of fermentable carbohydrates upon the products of bacterial metabolism are particularly noteworthy. Concentrations of dextrose of 1 per cent or more in peptone media may inhibit indole production by colon bacilli, or prevent the elaboration of proteolytic and liquefying enzymes by various organisms. The concentrations of sugar effective in these ways are much greater than those found in the blood of diabetics. If they should exert any influence in the diabetic animal these influences would be protective rather than harmful.

The knowledge accumulated by bacteriologists from the study of the formation of bacterial toxins is especially interesting in connection with infection in diabetes because the concentrations of carbohydrates in favorable media is within the range of the blood-sugar concentrations in diabetes mellitus. Most of the bacteria which produce soluble exotoxins in culture media require 0.1 per cent to 0.3 per cent of fermentable sugar for maximum toxin production. In preparing modern media for the production of diphtheria toxin 0.15 per cent to 0.3 per cent of dextrose, or dextrose and maltose, are added to the basic proteose peptone broth. The results obtained appear to indicate that there may be a possible relation between toxin-production in carbohydrate broth and infection in diabetes, and it is possible that this apparent relationship may be a basis for the clinicians' belief that blood-sugar and susceptibility to infection are directly correlated.

In practical bacteriology, however, concentrations of sugar surpassing those found in diabetic blood may be used with similar effects. Additions of carbohydrate until the concentration reaches 0.5 per cent of fermentable sugar will continue to permit the diphtheria bacillus to produce large amounts of toxin.

It is obvious from these facts that the carbohydrate metabolism of certain pathogenic organisms is extremely important for the elaboration of poisonous substances. But the actual connection between this process and infection in diabetes has not been demonstrated.

Bacterial virulence is sometimes associated with the formation of a capsule by the microorganism. As the capsular material is largely carbohydrate, the suggestion has been advanced that abnormal amounts of sugar in the blood may favor the development of a protective capsule by a bacterium in the tissues of a diabetic. Unfortunately for this suggestion there is no support for it to be found in bacteriology. The formation of capsules by bacteria is not strictly correlated with either the amount of fermentable sugar in a medium or the sugar content of the blood of an infected animal. It is, apparently, the expression of an inherent characteristic of a particular race, variety or strain of a species of bacterium.

When we come to the discussion of the second part of my topic, we should recognize at the outset that, although volumes of words may be used to describe conditions, no one can tell absolutely why one animal is resistant to infection and why another is susceptible, or why states of susceptibility and resistance vary from time to time in the same animal. Virulence of bacteria is definable only in terms of the host, and the definition of the resistance of the host must take into consideration some peculiar invasive or toxic effect of the bacterium. Thus the discussion of the development of infections in normal persons and persons suffering from chronic sickness inevitably leads into unsolved mysteries.

The infections of special interest to the physicians treating patients suffering from diabetes mellitus undoubtedly occur most frequently in those who have severe or uncontrolled diabetes. These complications are chiefly staphylococcal infections of the skin, subcutaneous tissues and blood stream. Infections with other organisms are said also to be more numerous and more apt to be severe in diabetics than in persons who do not have this metabolic

disorder. The question why infection is more common in uncontrolled diabetes than in other chronic metabolic disorders and possibly other chronic infectious disease has been a subject of study for a long time. I think that the most illuminating recent discussion of it is the paper by Dr. Mosenthal,¹ published last year. In fact, this paper contains summaries of most of the published scientific information that one may bring to bear on the discussion.

Dr. Mosenthal's final conclusion was that the concentration of dextrose in the blood of a diabetic was not directly related to resistance or susceptibility to infection. He expressed the belief that persistent glycosuria and loss of water over a long period were the factors which diminished the resistance of the patient.

I have asked Dr. Mosenthal what he believes is the mechanism back of glycosuria and dehydration which brings about diminished resistance to infection. It is difficult for me to see how those factors would operate on the cells, skin or other tissues of the diabetic in such a way as to render them more susceptible to bacterial invasion. I hope that later this evening Dr. Mosenthal will have more to say on the ultimate processes involved in this theory.

In my opinion the investigators who are working on the histology of the lesions and tissue changes in diabetes on the one hand and the endocrinologists on the other, have the possibility of explaining not only the incidence and course of infections in diabetes, but also the fundamental physiology of immunity, resistance and susceptibility. As you know, Dr. Reimann² found by experiment that patients with uncontrolled diabetes did not produce agglutinins in as high potency as controlled diabetics or normal persons. From this he suggested that in uncontrolled diabetics the capacity to produce antibodies against bacteria was reduced. Recalling his observations that in kala azar the

¹ Mosenthal, H. O. Hyperglycemia. *Jour. Am. Med. Assoc.*, 1935, 105, 184.

² Reimann, H. A. Immune Reactions in Diabetes. *Arch. Int. Med.*, 1935, 51, 789.

endothelial cells of the skin and other organs contain great numbers of parasites, Dr Reimann has suggested further that perhaps in severe diabetes the endothelial system may be adversely affected. From pathological investigations it has been known for a long time that endothelial cells in certain diabetics are actually crowded, perhaps blocked, with foreign material, fat or other substances. Although these relationships required by this theory have not been definitely demonstrated to exist, the evidence for them is suggestive and interesting.

As a precautionary note it should be remarked that there is no absolute correlation between agglutinin titre in the blood serum and the degree of resistance or susceptibility to infection. I have seen septicemia in a patient whose blood serum, diluted 1-100,000, agglutinated the bacterium cultivated from his blood. The organism did not appear to be agglutinated in the patient's blood vessels. Hence, it is not possible to draw from the results of agglutination tests conclusions applying to the state of resistance of an animal.

In recent days more and more attention is being paid to the relation of the glands of internal secretion to states of resistance and susceptibility. Notably in diabetes the pituitary, pancreas and adrenal are known to have important connected influences. From both published and unpublished observations it appears that these endocrine glands, particularly the pancreas and adrenal, may control some of the processes of defense against invading bacteria. The immunologists are beginning to enter this field. For years, however, physiologists studying experimental diabetes and the inter-relation of glands of internal secretion have been passing over events of great importance to the immunologist and clinician. The physiologists have given little more than cursory notice to the occurrence, characteristics and course of infections in the animals from whom they have removed one or several glands of internal secretion and whose diabetes or other metabolic disorder they have regulated by the administration of extracts of these glands. For example, I know that Dr C N H Long

and Dr Himwich have considerable information on immunological problems in their physiological notebooks. We hope very much that they will publish accounts of what they have observed.

In view of numerous uncertainties and with the realization that a bacteriologist can not speak with any authority on intricate clinical and physiological questions, I must state my conclusions in somewhat negative terms. In my opinion, (1) the concentration of sugar in the blood of diabetics has little or nothing to do with their states of resistance or susceptibility to infection, (2) such factors as loss of water may operate through effects on some mechanism not yet disclosed, and (3) the causes of these changes in resistance may be found in the interlocked influences of organs of internal secretion affecting not only sugar metabolism, but also the unknown means by which the body cells resist bacterial invasion and the deleterious effects of bacterial products.

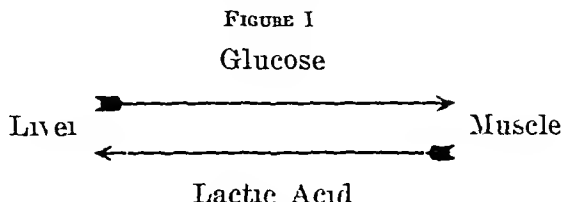
BLOOD SUGAR IN EXPERIMENTAL DIABETES*

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I greatly appreciate the honor of being invited by Dr Mosenthal to participate in the exchange of ideas on the subject of blood sugar in diabetes. Dr Bayne Jones has clarified the relationship of blood sugar to infections. My topic is blood sugar in experimental diabetes. There are two points of view in the treatment of diabetes. The first one calls for the maintenance of a normal blood sugar with values between 100 and 140 mgm per cent. The second point of view permits and even entertains a preference for higher levels of blood sugar as long as they are not accompanied by marked glycosuria and by ketosis. Tonight I shall review the evidence obtained from experimental studies of diabetes and also present new data in order to evaluate these two opposing conceptions of the management of diabetes.

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It is interesting to recall that the liver is the source of the blood sugar. After ingestion of carbohydrates, blood sugar rises, a result of the exogenous carbohydrates, but in the post absorptive state, the level of the blood sugar is



maintained by the breakdown of liver glycogen. With Doctors Chambers, Koskoff and Nahum,⁵ we were able to show that in diabetes, as in normal conditions, the mechanism which maintains blood sugar links muscle and liver in an intimate manner. Glycogen is not retained by the liver but breaks down to glucose, giving rise to the characteristic hyperglycemia of diabetes. This glucose circulates in the blood, is absorbed by all the organs, and particularly so by the large masses of muscle tissue. In muscle, glucose is synthesized to glycogen. However, this glycogen is not locked in the muscles. With muscular activity, it gives rise to lactic acid, and it should be noted, not to glucose. Apparently the ability of muscle to form lactic acid may be impaired but does not cease with the development of the diabetic state. Lactic acid then diffuses out of muscle to blood. This permits the liver to absorb lactic acid from the blood and resynthesize it to form glycogen. In this manner, the hyperglycemic level of the blood is maintained in the post digestive state during diabetes.

We must examine next the factors which regulate the level of the blood sugar. In this regard the endocrine glands are determining influences. Though inability to oxidize glucose necessarily causes an increase of blood sugar, it should be remembered that the concentration of the glucose of the blood is responsive not only to the secretions of the islands of Langerhans but also to those of other endocrine glands. The anterior pituitary, the adrenal, and the thyroid glands may act either synergistically or sepa-

rately to raise blood sugar. Thus they do by mobilizing liver glycogen and not necessarily by inhibiting the oxidation of glucose. Acromegaly in 40 per cent of all cases, may be accompanied intermittently by signs of diabetes including an increased blood sugar and a ketosis.⁸ The secretions of the anterior pituitary gland influence both carbohydrate and fat metabolism by liberating liver glycogen and stimulating fat oxidation. It is, therefore, incorrect to regard a high blood sugar and a ketosis as due necessarily to exhaustion of the islands of Langerhans. In patients with acromegaly the administration of insulin may be singularly ineffective. This action is explained by Houssay and Biasotti's⁸ conclusion that the anterior pituitary gland contains a hormone which inhibits the oxidation of carbohydrate. However, it should be noted that Chambers, Sweet and Chandler³ believe that the anterior pituitary does not inhibit the oxidation of carbohydrate.

The hormone of the medulla of the adrenal gland, like that of the anterior pituitary gland, affects liver glycogen. Cope and Marks⁴ have demonstrated that the secretions of the anterior pituitary and adrenal medulla act synergistically to deplete the liver of its glycogen. In a like manner, overactivity of the thyroid gland tends to diminish liver glycogen and therefore raise blood sugar without, however, inhibiting the oxidation of carbohydrate. Thus the concentration of glucose in the blood is not necessarily a gauge of the function of the islands of Langerhans but is a resultant of the interactions of various endocrine glands. The level of the blood sugar cannot, therefore, be regarded as the sole criterion for the body to oxidize carbohydrate and thus should not be used exclusively as an index for the amount of insulin necessary for the control of diabetes.

Later we hope to show that in contrast with blood sugar, urinary glucose may be of greater significance in determining the dosage of insulin. But first we must consider the effects of a heightened level of sugar in the blood on the metabolism of carbohydrate.

An increased concentration of blood sugar serves as a stimulus to carbohydrate metabolism. In response to the

rise of blood sugar following the ingestion of carbohydrate, glycogen is stored in liver and muscle while the oxidation of glucose is accelerated. In partial diabetes where the carbohydrate mechanisms of the body are impaired but still function to some degree, it is probable that a high level of blood sugar acts as it does in the normal individual to increase the metabolism of carbohydrate. Indeed, even in the diabetes following total pancreatectomy a high level of blood sugar aids in the storage of carbohydrate. Major and Mann¹⁰ found that intravenous injection of glucose increased the deposition of glycogen in liver and muscle of depancreatized dogs. On the other hand, removal of the liver is followed by a gradual and continuous decline of blood sugar. Mann and Magath¹¹ first studied dogs with pancreas intact and therefore unimpaired ability to oxidize carbohydrate. After hepatectomy, hypoglycemia always developed in these animals. With the removal of the liver, the cycle between muscle and liver was interrupted and the blood sugar decreased. When the glucose of the blood fell to the low level of 20 mgm per cent hypoglycemic convulsions occurred. These convulsions are, therefore, the response of the body to lack of carbohydrate. Mann and Magath¹¹ also removed the liver of dogs that had been depancreatized three or four days previously. These dogs initially had the high blood sugar characteristic of diabetes. Following hepatectomy of the depancreatized dogs, glucose was utilized for there was a progressive decrease of blood sugar just as in the non diabetic animals. However, in the depancreatized animals convulsions, indistinguishable from hypoglycemic paroxysms, occurred at levels of blood sugar higher than 100 mgm per cent or even 200 mgm per cent. Thus in diabetes, a decline of blood sugar, even though to values still well above normal, is followed nevertheless by symptoms similar to those of hypoglycemia in the animal with pancreas intact. These data have been interpreted by Lesser⁹ to indicate that a concentration of blood sugar greater than normal is necessary for the utilization of carbohydrate during diabetes. With impairment of carbohydrate oxidation, an increased

concentration of blood sugar is therefore compensatory, insuring a better utilization of carbohydrate. The improvement in the metabolism of carbohydrate must have an immediate effect on the utilization of fat, for an increased oxidation of glucose necessarily causes a better combustion of fat. The conception that high blood sugar aids the utilization of carbohydrate is, therefore, of utmost importance in the management of diabetes. It indicates the advantage of maintaining high levels of blood sugar. This applies especially to patients with raised renal thresholds for glucose.

Though a high blood sugar is beneficial, the ingestion of carbohydrate in quantities in excess of the oxidative capacities of the body has an adverse effect. Before insulin was discovered, it was a common experience to observe failure of the insular mechanisms as a result of the ingestion of carbohydrate in quantities greater than could be metabolized by the patient. The overtaxed oxidations became completely, if temporarily, exhausted. Today, however, such consequences are no longer to be feared for the administration of adequate amounts of insulin spares the endogenous mechanisms from an excessive load. Moreover, a higher blood sugar level is not necessarily a strain on the ability to oxidize carbohydrate. Mosenthal¹² has stressed that a high blood sugar may be maintained for long periods with no deleterious effects in patients with diabetes. Indeed, many people with no apparent defect in the oxidation of carbohydrate exhibit levels of blood sugar well above the usual average values. This is in accord with our previous conclusion that a high level of blood sugar is not necessarily a sign of impairment of the functions of the islands of Langerhans but may indicate instead a mobilization of liver glycogen due to overactivity of other endocrine glands.

If an increased blood sugar does not necessarily injure, and may, in fact, aid the metabolism of carbohydrate, where then, does the chief disadvantage of high blood sugar lie? At present, the evidence indicates that a most serious danger in diabetes is dehydration, which may lead to collapse. Dehydration, moreover, is an element of diabetic

coma The inception of dehydration lies in the production of the ketone acids With the impairment of carbohydrate metabolism, additional fat must be oxidized if life is to be maintained However, the diminished ability to oxidize carbohydrate makes the complete combustion of fat impossible As a result, acetone substances accumulate Therefore, a specific acidosis, a ketosis, supervenes This is the characteristic acidosis or ketosis of diabetes One of the chief compensatory mechanisms to overcome this ketosis resides in the function of the kidney to produce ammonia for the formation of ammonia salts These ammonia salts of the acetone substances are eliminated in the urine, and in this manner the ketosis is diminished However, in severe diabetes, ketone acids accumulate more rapidly than the kidney can form ammonia All the ketone substances cannot, therefore, be eliminated as ammonia salts For this reason, the sodium of the blood must be utilized for this process Thus sodium salts of the ketone acids are also excreted and appear in the urine When sodium leaves the body, it has an entirely different effect than has ammonia, for sodium is a constituent of the body fluids The loss of sodium would render the body fluids hypotonic, that is, too dilute, if water were not excreted with the sodium As a result of the diminished sodium content of the blood, water is eliminated and the dangerous dehydration of diabetes supervenes This conception, presented by Peters¹³ describes one of the two mechanisms of dehydration in diabetes

TABLE I

A MECHANISM OF DIABETIC DEHYDRATION

- 1 Ketonuria
- 2 Sodium Salts
- 3 Water

As you will note in the table, the first step in the process of dehydration consists of the elimination of ketone substances The second involves the excretion of sodium as an aid in the elimination of the acetone substances, and finally the loss of water follows that of the sodium salts

In 1933 Atchley, Loeb, and their co workers² suggested a second potent mechanism in the causation of diabetic dehydration. These investigators studied two patients with severe diabetes. One required approximately 85 units of insulin daily, and the other about 75 units of insulin to maintain the urine free of sugar. In both these patients, insulin injections were stopped for short experimental periods. With both patients a glycosuria, a polyuria, and a dehydration ensued. Despite the fact that in both patients organic acids of the urine increased and in one of these cases the ketonuria was marked, Atchley, Loeb, and their co-workers² were able to dissociate the dehydration secondary to glycosuria from that produced by the acidosis and therefore came to the conclusion that glycosuria, of itself, may be a cause of dehydration. That glycosuria can produce dehydration has been demonstrated in previous work of our laboratory. In a paper presented from this platform during the Graduate Fortnight in 1933,^{6, 7} we were able to show that concomitant with the loss of glucose in the urine, dehydration occurred. Acute depletion of the body fluids resulted in the development of fever, diabetic hyperpyrexia. In studies now being made in our laboratory at Albany, we are attempting to examine the mechanism of dehydration when there is no ketosis to initiate the loss of the body fluids. We are employing the partially depancreatized preparation used so effectively by Frederick M. Allen.¹ Our animals weigh from 7 to 15 kilos and usually all but one or two grams of their pancreas are removed aseptically. In many respects this preparation resembles that of a human being with diabetes, for not only are some of the external secretions, the digestive enzymes, of the pancreas retained but also a portion of the internal secretions and therefore partial ability to oxidize carbohydrate. Examinations of the blood sugar disclosed, moreover, that the oral administration of one gram of glucose per kilo of body weight produced the typical heightened and prolonged glucose tolerance curve of severe diabetes. Our preliminary observations revealed a close correlation between the amount of glucose excreted in the urine and the total bases, especially

the sodium, of the urine. When sugar was excreted, water was also eliminated and with the water, salts, chiefly, sodium chloride. We next stabilized our animals much in the same fashion as patients with diabetes. They were given carbohydrate, fat and protein in amounts sufficient to maintain caloric equilibrium and insulin in doses adequate to prevent glycosuria. Salt was added to the diet in an attempt to prevent rapid depletion of the sodium reserves. Due to the diabetic condition of these animals, the post absorptive level of the blood sugar was high, up to 300 mgm and more. Nevertheless, with the aid of insulin, daily loss of sugar in the urine was not significant. Despite a high level of blood sugar with no glycosuria, there was no polyuria, and no dehydration. High blood sugar of itself produces no dehydration.

This fact is particularly important in human diabetes and especially so in cases of some duration in which the renal threshold rises as the disease continues. These observations leave no doubt that a high blood sugar in patients with diabetes will produce no dehydration when unattended by glycosuria. The next step was to study the effect of glycosuria. To do this we increased the glucose content of the food of these animals. No other change was made in the diet and the dosage of insulin was kept unaltered. Thus, unlike the previous experiments of Atchley, Loeb, and their co workers, the present observations involved no decreased oxidation of carbohydrate and therefore no accumulation of acid substances. Thus, the only direct effect of this change in the diet was the production of glycosuria. Nevertheless, the glycosuria was accompanied by a polyuria. Though the kidney may concentrate glucose to 10 per cent or more, additional water must also be excreted by the kidney. The glycosuria forces an increased renal excretion of fluids.

In the table are presented the data of one of our animals. They represent the results of three control days just before the ingestion of increased amount of glucose and the analyses of the last three days of an eight day period of glycosuria without ketonuria. The augmented ingestion of

glucose produces a glycosuria. Associated with an increase of glucose is that of the volume of the urine. The polyuria increases the quantities of base or salts of the urine. Apparently water is eliminated with salt. Therefore, there is a direct relationship between the glucose, the urinary volume and the salts excreted. They all increase together. As you can see in the last column the intake of water is augmented. This also must be attributed to the glycosuria. The water supplied to our animals was unlimited. The salt content of the diet was, however, kept constant. With increasing urinary volume, the output of salt or base finally exceeded the intake. As a result, the sodium of the body was depleted. With the loss of sodium and water, dehydration developed. The depletion of body fluids over the period of eight days is evidenced by the loss of weight.

TABLE II
EFFECT OF GLYCOSURIA WITHOUT KETONURIA
ON URINE

<i>Date</i> <i>Jan</i>	<i>Glucose</i> <i>Grams</i>	<i>Volume</i> <i>CC</i>	<i>Base</i> <i>ME</i>	<i>Water</i> <i>Intake</i> <i>CC</i>
5	0	156	21.0	565
6	0	210	38.6	330
7	0	129	23.7	360
13	44.7	630	65.7	1000
14	77.5	1360	73.0	1400
15	73.2	1200	60.3	1560

TABLE III
EFFECT OF GLYCOSURIA

Eight Days

	<i>Weight</i> <i>Kilos</i>	<i>Blood</i>	
		<i>Serum</i> <i>Protein</i> <i>Per Cent</i>	<i>Oxygen</i> <i>Capacity</i> <i>Vol Per Cent</i>
Control	7.20	6.38	17.60
Dehydration	7.00	7.07	18.94

This decrease of weight correlates with the greater volume of the urine. The diminution of the fluids of the body may also be seen by the increased serum protein and the raised oxygen capacity of the blood, results of dehydration.

TABLE IV

MECHANISMS OF DIABETIC DEHYDRATION

1	Ketonuria	1	Glycosuria
2	Sodium Salts	2	Water
3	Water	3	Sodium Salts

Here then is a second mechanism of dehydration. As presented in the table, it is initiated by the glycosuria which increases the excretion of water, thus producing a polyuria and finally a loss of salt. In contrast to the mechanism previously described in which the inception of the dehydration was caused by a ketonuria, the loss of sodium preceding that of water, in the present experiments by avoiding ketonuria, it has been possible to demonstrate that the loss of water may be the cause of the depreciation of the sodium reserves of the body.

If this is so, then the administration of added amounts of salt in the diet should prevent dehydration. We gave our animals, depleted of salt and water, an additional 10 grams of salt daily for two days, and despite the continued glycosuria observed in these dehydrated animals, a subsequent dilution of the blood and a gain of weight due to restoration of the body fluids. Water was retained and the salt deficit was made up. Even though dehydration is conditioned by loss of salt, it must be remembered that the cause of the depreciation of the salt of the body is the presence of excessive amounts of sugar in the urine. These observations suggest, therefore, that in the management of diabetes, the examination of urinary sugar is more significant than that of blood sugar. As long as the glycosuria is not excessive, there is no fear of dehydration. A slight glycosuria is, however, only of secondary importance. The loss of a relatively small amount of energy containing substances in the urine is not serious.

The review of the literature and the new evidence leads to the following four conclusions (1) The level of the blood sugar is a resultant of the activity of various endocrine glands. It is, therefore, not necessarily an index of impaired ability of the islands of Langerhans but may indicate instead hypertunction of the adrenal, the thyroid, and particularly of the anterior pituitary glands. (2) During diabetes as in the normal, an increased concentration of blood sugar serves as a stimulus to carbohydrate metabolism and therefore is not to be combatted unless accompanied by a definite glycosuria. (3) Dehydration may be a result of glycosuria. The development of a marked glycosuria should, therefore, never be permitted to continue even for short periods. (4) And finally, as a result of the three previous conclusions, it follows that the glucose content of the urine rather than that of the blood should be taken as the criterion of the amount of insulin indicated in diabetes mellitus.

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BLOOD SUGAR IN DIABETES MELLITUS*

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The blood sugar is an excellent and useful criterion of the behavior of carbohydrate metabolism. Regulated by normal physiological processes, the sugar of the blood has a constancy within definite limits, and in its behavior like other biological constants it tends to return to its original level when the factor for its alteration is corrected. After the complex carbohydrates are simplified by the digestive enzymes in the gastro intestinal tract, they are carried as glucose by the portal vein to the liver where a molecular rearrangement takes place and glycogen is formed. This biochemical process is not always in one direction. It is reversible, and it is inferred that the liver can also supply the blood with glucose from the glycogen it has stored. It is obvious, therefore, that the liver plays a most significant role in the metabolism of carbohydrates. It is the carbohydrate storehouse, storing the sugars in the form of glycogen and making excellent use of its savings when the organism is in want of sugars and cannot for various reasons

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obtain them exogenously. Thus, during a meal rich in carbohydrates, the blood sugar will rise, but a considerable proportion of the excess will be withdrawn by the liver, converted to glycogen and stored, only to be reconverted into glucose and thrown into the blood stream if the blood sugar should fall below the physiological level. By this means the blood sugar in health is kept within definite limits. These are 80 to 100 mgm per cent during a fasting state. After an average meal the blood sugar may rise to 140 mg per cent while after a concentrated carbohydrate meal the value may rise as high as 170 or 180 mg per cent. It must be pointed out, that the role of the liver in this regulating process is more or less a passive one, as there are many factors which affect its activity directly or indirectly. Of such factors intimately concerned with carbohydrate metabolism, insulin plays a most dominant role and all of us are well familiar with the clinical picture which results from the lack of production or faulty utilization of this hormone. This profound alteration in the carbohydrate metabolism primarily, is known as diabetes mellitus and in addition to its clinical symptomatology of hunger, loss of weight, thirst, frequency of urination, weakness, transient blurring of vision and distressing pruritus chiefly in women, there is a hyperglycemia and a glycosuria. The liver is no longer capable of maintaining the blood sugar at the physiological level because one of the governing mechanisms, insulin, is insufficient. There is faulty storage of glycogen and faulty oxidation of glucose. The blood sugar begins to rise and when it reaches a level of 170 or 180 mg per cent sugar will appear in the urine. This is true in the majority of the cases, though I have seen some blood sugars between 200 and 300 mg per cent without a glycosuria. The rise of the blood sugar does not cease at the levels mentioned, but it may rise to a figure of 1000 mg and over.

With this brief resume of normal and abnormal carbohydrate physiology and with the knowledge that insulin can alter some of the abnormalities discussed, we can now proceed to the discussion of the blood sugar in diabetes

mellitus Some phases of the subject are controversial and some are quite factual *The most accepted fact is that the blood sugar in diabetes mellitus is elevated and maintained at a highly abnormal level unless treated* All agree that the sugar in the blood is glucose—and that it is fermentable Most physiologists do not accept the γ -glucose hypothesis of Winter and Smith While there is no unanimity of opinion regarding the glycolytic power of diabetic blood as compared with the normal, the preponderance of evidence is that no difference exists

About ten years ago I interested myself in the subject of glycolysis sharing the view that insulin acted by increasing the glycolytic rate This was not the case, however, as I proved to my satisfaction that the sugar content of diabetic and normal blood kept at room or incubator temperature disappeared at the same rate Glycolysis did *not* proceed at a less rapid rate in diabetic bloods There is no difference of opinion concerning the effect of infections on the blood sugar in diabetes mellitus All agree that during infections, it is always elevated All agree that a normal blood sugar is highly desirable in the treatment of diabetes but not many appreciate the fact that under certain conditions a hyperglycemia per se is not deleterious, but may even be desirable In other words a high blood sugar *without a glycosuria* can be tolerated by patients without any damaging results

Specifically, the discussion of the blood sugar in diabetes mellitus may be approached from three practical considerations, namely the value of blood sugar analyses from the point of *diagnosis, prognosis, and treatment* From a study of a large group of glycosurias and a correlation of the blood sugar findings with them I am firmly convinced that from a *diagnostic* consideration, blood sugar studies are of the greatest and most valuable aid The benign glycosurias are too well known to all of us and in such cases a definite diagnosis can only be made by means of blood analyses It is the usual procedure in cases of glycosuria to examine the blood for its glucose content in a post absorptive state and if the result of such an analysis prove inconclusive then

the patient is subjected to any of the well known tolerance tests. The one most widely in use is the so called glucose tolerance test. The patient is given 50 to 100 gms. of glucose and the blood is examined for its sugar concentration at a fasting, $\frac{1}{2}$, 1, 2 and 3 hour interval. In the normal individual the maximum rise may reach 180 mg. per 100 c.c. At the end of an hour the concentration of blood glucose begins to fall so that at the end of the third hour there may be less glucose in the blood stream than at its beginning of the test. In the diabetic, on the other hand, the fasting blood sugar is usually above the normal level and even if it is reduced to a normal figure by means of diet, insulin or both, a glucose tolerance test, may send the blood sugar up to 300 and 400 mg. even at the end of the third hour.

There are certain cases where the blood sugar may reach a level of 200 at the end of the first hour and a glycosuria may appear at this point, but the curve falls sharply and conforms to the configuration accepted as normal. I do not consider such curves pathognomonic of diabetes. Now all of this is quite familiar, and yet there is an important consideration which must be weighed in the evaluation of any carbohydrate tolerance test, namely the patient's previous diet.

Some years ago a group of Scandinavian¹ observers called attention to the fact that even in normal individuals a 24 hour fast, or a high-fat-low carbohydrate diet will so alter the character of a tolerance blood sugar curve that a false diagnosis of diabetes will be made. I² have had the opportunity of performing such an experiment on two men whose diet consisted of protein and fat—an exclusive meat diet. In both subjects typical diabetic curves were produced following the ingestion of 100 grams of glucose. In one of the men there was a glycosuria as well. The use of a general diet for a two week period cured this artificial diabetes as the repetition of the glucose tolerance test at the end of that time failed to reveal any abnormality. It is obvious therefore that the blood sugar is of considerable diagnostic aid in cases of glycosuria, either as a single fasting specimen

or as a series of specimens after a tolerance test. In the vast majority of cases it will help establish, or rule out the diagnosis of diabetes mellitus. I also wish to lay particular emphasis on the consideration of the patient's diet prior to the performance of a tolerance test since it plays such a significant role in the proper evaluation of the resulting blood sugar curve. Diseases of the liver may also be responsible for abnormal glucose tolerance curves and before accepting a curve as significant of diabetes one must make certain that no liver pathology is present.¹³

Is the blood sugar of any prognostic significance? Does the routine estimation of the blood sugar in diabetes mellitus help in the evaluation of the severity of a case? I do not think it does. Some ten years ago Petten³ attempted to use the blood sugar as a measure of severity and he considered an initial value of 240 mg or over as an indication of a severe diabetes. Gray⁴ pursuing this trend of thought attempted to show the relation of the percentage of the blood sugar when the patient was first seen, to the duration of such a patient's life. From his studies Gray concluded that the higher the blood sugar, the more severe the diabetes. This point of view has been rather universally accepted, but it certainly can stand revision. It requires time and observation of any given case of diabetes before a prognosis can be given intelligently. It certainly is most fallacious to prognosticate from a blood sugar examination alone. I do not consider an initial blood sugar of 300 mg of more ominous prognostic significance than one of 200 or 150. The deduction that I draw from such figures in the absence of any infection is that the higher blood sugar may be a reflection of the patient's carelessness in executing dietary directions. Joslin,⁵ from whose clinic Gray published the data referred to, now feels that the prognosis in a diabetic case can not be determined by the result of the blood sugar test. He cites a diabetic patient who on admission showed a blood sugar of 400 mg and a glycosuria of 4.8 per cent whose health 20 months later was excellent and whose diet consisted of protein 75, fat 100, carbohydrate 250 and only 6 units of insulin. "One can not tell

from an initial blood sugar," says Joslin, "the outcome of a case though this was not the rule before the discovery of insulin." This fact was fully appreciated by Petren and his coworkers, and, because of this inadequacy of a single blood sugar determination as a prognostic guide, they have attempted to evaluate the severity of the diabetes from a study of the 24 hour blood sugar curve. Blood samples were taken at two hourly intervals during a 24 hour period and the character of the curve served as an index of severity. They have worked out such blood sugar curves for fast days and food days. They also demonstrated that the blood sugar in certain cases of diabetes is subject to tremendous oscillations during a 24 hour period. All these data are of considerable interest, but I question their applicability, as it is not practical to carry out 24 hour blood sugar analyses in most cases, even though this procedure might afford a trustworthy indication of severity. It is my feeling that response to therapy is a much more reliable index of severity, and no single blood sugar determination regardless of its magnitude will dampen my optimism if the patient's glycosuria diminishes, if he gains in weight and strength and if he is able to tolerate more carbohydrates and total calories without any, or additional units insulin.

Now as to the value of blood sugar studies in the *treatment* of diabetes mellitus. I am in accord with the school of diabetologists who advocate a normoglycemia. A normal blood sugar in a diabetic is usually accompanied by a sugar free urine. That is the optimum goal. Given, however, a sugar free urine, but with a blood sugar level of 200 or 250, is it advisable in such cases to aim at lowering these blood sugars even though no sugar is excreted? I do not think so. There is no clear evidence that a hyperglycemia without a glycosuria is damaging, and, furthermore, such a condition may even be desirable in a certain group of diabetic patients. This view may sound unorthodox but a review of the available evidence will help dissipate doubts concerning this assertion.

In the August number of the Journal of the American Medical Association, Mosenthal⁶ in a publication entitled "Hyperglycemia," presents evidence bearing upon this question. Therein, he cites the works of Kuby, Estey and Weiner and that of Cannel showing that culture media containing three to four times the normal concentration of glucose do not inhibit or interfere with growth of tissues. He also presents the work of other investigators who claim that bacteria do not grow more rapidly in culture media of high sugar concentrations. Furthermore, he cites the fact that addition of dextrose to blood does not alter its bactericidal potency against staphylococci, nor make growth of this organism more luxurious.

The above data certainly offer striking evidence that under certain experimental states a hyperglycemia in vitro is not deleterious. Then there are other experimental conditions demonstrating the benefits of a hyperglycemia. Bayliss, Muller and Starling⁷ showed that in order to maintain heart-lung preparations in good condition insulin and glucose had to be used and that in the absence of insulin, *enormous concentrations of glucose were required* to compensate for the insulin lack. Cruikshank and Shrivastava⁸ showed that the sugar utilization of the heart is increased, by insulin, or *by maintaining a high blood sugar concentration*. In other words a hyperglycemia may act as a compensatory mechanism. Clinical observation has given ample support to these experiments. During the past 4 or 5 years observers from various parts of the country have noted that in some cases of diabetes mellitus lowering of the blood sugar, not necessarily to hypoglycemic levels, was associated with symptoms referable to the heart. Levine⁹ of Boston issues unequivocal warning against the rapid reduction of a hyperglycemia in a diabetic with coronary artery disease. I have seen one death associated with the use of insulin in a diabetic, who was also suffering from coronary sclerosis. Even though there was a temporal relationship I was not convinced that it was cause and effect as cases of coronary sclerosis may also die without any apparent cause. However, the work of Strouse¹⁰ and his associates on this

subject, made me feel that some such relationship exists. They found that in the older diabetic a marked reduction of the blood sugar whether by insulin or diet was associated with manifestations of cardiac abnormalities such as paroxysmal auricular fibrillation, intraventricular block and the clinical picture of angina. Sherrill¹¹ of California advises that the hyperglycemia of the elderly diabetic, particularly when evidences of atherosclerotic changes are demonstrable, be handled most conservatively. We thus see from the data presented that hyperglycemia does not interfere with or inhibit tissue growth, that hyperglycemia does not furnish some bacteria—staphylococci—a more fertile soil for growth, and that hyperglycemia may be of benefit in the elderly diabetic patient, who reveals evidence of vascular disease. I have seen a considerable group of diabetics in their fifth and sixth decades whose blood sugars were twice the normal, but whose urines were free from sugar. These patients maintained their weight, they were symptom free and carried on with their daily routine. But as soon as continuous glycosuria set in because of dietary indiscretions or infections then, and only then did symptoms of diabetes become apparent. In certain cases of diabetes mellitus a hyperglycemia without a glycosuria is seen and in such cases it is my feeling that a *sugar free urine is a satisfactory criterion of good therapy* from the laboratory view point. With younger diabetics under such circumstances the blood sugar will in the majority of cases approach the normal figure, in the older diabetic let the blood sugar seek its own level, even though it is above the figure considered normal.

This point of view will no doubt bring forth the criticisms that good therapy must not only ameliorate suffering, it must also prevent complications and a high blood sugar even without a glycosuria may lead to undesirable sequelae, which according to popular medical opinion of many years, are—infections as immediate complications and atherosclerosis as remote. I am not referring to the diabetic who is spilling sugar, I have in mind the patient who has only the hyperglycemia. Is this type of patient more subject to

infections and atherosclerosis than the diabetic with a normoglycemia? From my observations and experience he is not. True I have seen nail infection, boils, tuberculosis, pneumonia, otitis media, mastoiditis and common colds in our group of diabetics, but I do not think that such infections were more prevalent among these patients, than any group of individuals under similar living conditions, and many of our patients revealed hyperglycemic states—some with and some without glycosurias. It is my feeling that this association of infections and diabetes has become so deeply rooted, with the resulting view point that hyperglycemia renders the patient more susceptible to infectious processes. Mosenthal is of the opinion that the tissue dessication and the debility resulting from a persistent glycosuria predispose the patient to infections and that the hyperglycemia per se is not deleterious. Infections, however, no matter how slight, affect adversely the carbohydrate tolerance and are therefore dreaded as complications. Now as to the complication of atherosclerosis. Does a high blood sugar alone favor or hasten the development of vascular sclerosis? No one really knows. The hypotheses are multiple, conflicting and confusing. The experimental evidence of MacLeod¹² failed to corroborate this postulate. He maintained two depancreatized dogs in a state of hyperglycemia and glycosuria for 4 years and was unable to demonstrate any arterial sclerosis. The more fashionable thought is to associate a hypercholesterolemia and ketonemia with atherosclerosis, and furthermore there are many who feel that in an individual with vascular sclerosis and diabetes, the diabetes may be the result and not the cause. With such conflicting concepts regarding the damaging effects of a hyperglycemia and with so much evidence that it may be of benefit in a certain group of diabetic patients is it essential in the treatment to insist on normal blood sugar value, having rendered the urine free from sugar? The patient is the one who can best guide us in this respect. If he feels well, is able to carry on, maintains his weight and is satisfied with the dietary prescription and at the same time does not excrete sugar I do not advocate any

further dietary change or the use of insulin to reduce the blood sugar, should it be found above the accepted normal value. The argument has been advanced that it is wise to reduce the blood sugar to its normal level, regardless of the urinary findings, because it represents a physiological state. In the non-diabetic such a hypothesis is tenable. In the diabetic I feel that a moderate hyperglycemia may represent the organism's adaptation to an abnormal situation. No one will deny that a heart of normal size is most desirable but that under certain conditions its hypertrophy serves a useful purpose. This is just one of many examples of bodily adaptations to pathological states and I feel that a mild hyperglycemia is another, and should not be too zealously treated as long as the urine is free from sugar.

To summarize I conclude as follows:

1. The determination of the blood sugar is of greatest value in the *diagnosis* of diabetes mellitus. This determination is of help as a single fasting specimen or as a series of specimens following any of the tolerance tests. In the evaluation of such tests diseases of the biliary tract and the previous diets of the patient must be reckoned with.

2. A single blood sugar determination is of little value in determining the severity or prognosis of a case of diabetes mellitus.

3. In the treatment a sugar free urine is a satisfactory laboratory criterion. In the young diabetic the blood sugar will approximate normality under such conditions, in the older patient let the blood sugar seek its level, even though high. There is little evidence to prove that such a hyperglycemic state is deleterious and there is considerable evidence that it is desirable.

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DISCUSSION

DR ELAINE RALLI Mr Chairman, fellow members I am very glad to have been asked to discuss these papers this evening and I must say it is very easy because I am in entire agreement with practically everything that the three speakers have said I should like to stress one or two points If I may go back to one of the points that Dr Himwich brought out in his paper, that is the matter of dehydration It is a peculiar thing that although dehydration has been spoken of repeatedly, Dr Himwich showed it very beautifully here in 1933 at the Graduate Fortnight, Atchley has reported it, and Peters and his collaborators have written on the subject, that too little attention has been paid to it clinically as probably one of the most important factors in diabetic ketosis The importance of dehydration is borne out by the fact that treatment of diabetic coma by insulin alone, although it may clear up the ketosis, will not always return the patient to a conscious state, and the additional injection of saline intravenously will bring back consciousness, which from the patient's point of view, is a very desirable state to be in We recently had an opportunity of observing a case in which the dehydration and anhydremia were unusually severe because of a preceding period of starvation which antedated even the ketosis The CO₂ combining power was 17.06 per cent and the blood sugar high Here again I agree with Doctors

Tolstoi and Himwich that blood sugars are of relative importance. When treated with N/saline the patient lost a good deal of the fluid, due to the fact that the preceding starvation had reduced the level of protein in the blood, and absorption from the blood was apparently impaired. The dehydration therefore was not relieved. Following a transfusion, however, fluid was again administered, very rapidly absorbed, and the patient returned to a normal state in an amazingly short period of time, actually two hours. Dehydration with its complications is one of the primary reasons for controlling glycosuria.

The relation of glycosuria to blood sugar has been very well brought out and as I say, I am very much in agreement with what has been said. Personally, I sometimes feel that it would be wiser never to do blood sugars on diabetics, because, strangely enough, both the patient and occasionally others having taken a blood sugar, seem to think that it stays at that level until the next blood sugar is taken. The patient will constantly tell you, "My blood sugar was so many counts." Naturally, it varies a good deal during the day in normal persons and more so in diabetics, and if the patient is treated on the basis of blood sugar, overdoses of insulin are very often given, and hypoglycemia occurs which seems to me a very undesirable thing to have happen. Therefore, I would stress again what Dr. Tolstoi has said, the effort should be to maintain a sugar free urine and this will probably mean a blood sugar within fairly reasonable limits and the prevention of marked glycosuria will avoid the consequent dehydration that occurs with the loss of fluid.

If I may go back now to the first paper, I would like to speak of just one or two things, and that is the matter of infection in diabetes. I am glad Dr. Bayne Jones brought out the fact that hyperglycemia has no effect on the increased or diminished resistance of an individual to infection. It seems to me that one forgets that the diabetic is subject to a profound disturbance of nutrition, and these elements are probably the factors which lead to a diminished ability to resist infection. I say this for two reasons.

One is that we have the experience of treating people on the Third Medical Division at Bellevue Hospital who are badly nourished and we find infection in those individuals who have been subject to a poor diet for a period of time. Secondly, because of our experience with depancreatized dogs. The depancreatized animal can be kept in a perfectly good state providing the diet is absolutely adequate. If you omit one element from the diet of this animal, its reaction is much more violent than if the same element is omitted from the diet of the normal animal. I hold no brief for the fact that vitamin A is, or is not an anti-infective vitamin. I think undoubtedly the proof is not sufficient. However, it apparently has something to do with the general state of nutrition. If a normal animal is placed on an A deficient diet, it will show certain symptoms, and it will develop certain infections sooner or later. A diabetic animal deprived of Vitamin A will show these same symptoms much more rapidly. Apparently, then, the diet influences the general state of nutrition. In a diabetic individual, particularly the one who is not controlled, the losing of valuable nutritive elements in his urine as the result of an increased loss of fluid and being on a diet that is not adequate in vitamins and minerals probably contributes to a general state of under-nutrition. Another point which brings this up at the present time is the fact Dr. Root in Dr. Joslin's clinic has shown that the incidence of tuberculosis is increasing in diabetics, and decreasing in individuals of the same age who are normal. This again I think is probably due to a poor state of nutrition in the diabetic individual, and this fortunately need not now occur, because the type of diet used in the diabetic now so nearly approaches the normal that it should contain all the elements that are required in the normal diet.

DR H. RAWLE GUYLIN: I have enjoyed listening to the speakers of the evening. As regards Dr. Bayne Jones' paper that the degree of hyperglycemia probably has no influence upon susceptibility to infection in diabetes, I am

in hearty agreement. It is also true that diabetics kept in ideal condition as regards freedom from glycosuria and hyperglycemia are sometimes more subject to infection than others who show constant hyperglycemia. I should like to refer to a case in point. A girl who has been well treated with diet and insulin for the past 14 years recently developed lobar pneumonia. In spite of the fact that prior to the onset of the pneumonia she was always sugar free with normal blood sugar and that this condition obtained throughout the disease, she died on the third day of a rapidly spreading pneumonia with leukopenia. During the course of her brief and fulminating infection she never showed any sugar in the urine nor hyperglycemia. In this instance, she received 200 grams carbohydrate per day with 10 units of insulin every 3 hours.

I concur with the point brought out by Dr. Rall, and which I would like to emphasize even more than she did, namely, the fact that the incidence of infection in diabetics seems to me to be more readily affected by the nutritional state of the individual rather than by the blood sugar level. Diabetics who are adequately nourished, free from glycosuria and maintaining normal weight are less apt to have an infection than are those who are kept in moderate or extreme degrees of undernutrition. This is particularly true in the case of tuberculosis. I believe that Joslin has found that the incidence of tuberculosis in diabetes is increasing. Such is not in accord with our findings. We are seeing less tuberculosis amongst diabetics than formerly. Here again I feel that the difference of opinion is due to undernutrition vs. normal nutrition.

As I understand Dr. Himwich, he makes the point that the onset of polyuria in diabetic acidosis is primarily brought about by the excretion of ketone acids. Such has not been our experience. Polyuria in diabetics going into acidosis usually develops because of a steadily increasing glycosuria and is quite apparent before there is much ketonuria, sometimes before the appearance of any ketonuria, and as has been shown by numerous observers, dia-

betics of normal weight and strength do not develop a polyuria unless the urine contains at least 50 or more grams of sugar during a 24 hour period

It is gratifying to hear what most of the speakers have said regarding blood sugar. I think the importance of a blood sugar test in the management of diabetics is overrated. This does not mean that I believe the test should be discarded. However, I think many of us are inclined to attach too much significance to a degree of hyperglycemia which is little above the normal level of spilling, i. e., 170 mg. Also, we must not forget that very often one blood sugar determination during a 24 hour period gives us no picture of what the blood sugar may show at every other 5 minute period of the day and night. Many times we have taken 4 to 8 blood sugars during a 24 hour period and found only one or possibly 2 above the level of 170 mg. The others have been well within the normal limits, and the patients have been sugar free in their urine.

Finally, I should like to reemphasize the statement which I have made on other occasions and have alluded to tonight, namely, that normal nutrition by means of normal diet should be the therapeutic goal of every clinician who treats diabetes. Both overnutrition and undernutrition are to be avoided.

DR. FREDERICK M. ALLEN: Mr. Chairman, ladies and gentlemen. I am glad that Dr. Himwich is taking up the study of the partially depancreatized dog, because I have always considered it the ideal means of reproducing human diabetes. I would remind, him, however, that what I used was not the Sandmeyer preparation. In the literature he will find that the Sandmeyer procedure was to leave a portion of the pancreas to atrophy without a duct, whereas the dogs I used had a piece of pancreas connected with the bowel, so they could thus digest food and reproduce clinical diabetes very satisfactorily.

As the first speaker has stated, bacteriology does not explain the susceptibility of the diabetic to infection. On the other hand, these experiments with diabetic animals

sugar as the ideal of treatment. I myself, when a patient comes to me with an abnormal condition, feel that I can render him no greater service than to restore him as nearly as possible to normal, and I do not aspire to improve upon nature. From the treatment of a few thousand diabetics, I can testify that there is no particular difficulty in keeping the blood sugar within an approximately normal range, except in a small number of cases, furthermore, there is no great hardship on the patients. I have never seen a single instance of harm from this policy. I think I have seen benefits. I know this that in a few instances of long standing diabetes I have seen typical complications, of retinitis and gangrene, which developed at a time when there was high blood sugar without any sugar in the urine, and which subsided with the mere reduction of the blood sugar. The idea of the benefit of high blood sugar, especially in heart disease, is based, it seems to me, upon a curious misconception of both physiology and medicine, namely, upon the idea that a high blood sugar due to impaired utilization of sugar is equivalent to the high blood sugar created by intravenous injections in the presence of normal utilization. The benefit is in the utilization, not in the flowing of sugar past the heart cells without utilization. I agree that certain patients with coronary disease may die from insulin reactions, and it is therefore inadvisable to proceed rashly in such cases. But it is not necessary to proceed rashly. I agree thoroughly with Dr. Joslin and others who say that the very fact that the heart is diseased creates all the greater necessity of aiding it by making the utilization of sugar as nearly normal as possible.

As there is no time for further details, I wish to close with just two questions. First, we have been speaking about partially depancreatized dogs. Would the advocates of high blood sugar in heart disease wish to partially depancreatize their cardiac patients, in order that they might have the benefits of a continuously elevated blood sugar due to slightly impaired utilization? Second, I have referred to Dr. Hagedorn's protamine insulinate, which I have been privileged to begin using, in the hope that it will provide

a more efficient means of regulating the blood sugar. Suppose that this regulation can be carried further, so that we shall be able easily to maintain any desired level of blood sugar. Suppose that the progress extends still further, so that we are offered an actual cure of diabetes, with the necessary result of a return of the blood sugar to normal. Will the advocates of high blood sugar reject such therapeutic procedures, in order that their patients may continue to enjoy the benefits of hyperglycemia?

DR HERMAN O MOSENTHAL. It is perfectly true that I invited the speakers to come here tonight. On the other hand, there were only three whose views I knew, Dr Ralli and Dr Allen, the third one I thought sided with Dr Allen—at least he told me so fifteen years ago when we discussed this subject. Apparently he has changed his point of view since then.

I was very anxious to have as the objective of this meeting the presentation of the unbiased thought of men who were well-versed regarding infections, who knew about the experimental side of diabetes, and those who were experienced clinicians. Our speakers and discussors have told us from their point of view what is presumably correct. It is obvious that if we have a means for regulating the blood sugar no physician is going to avoid maintaining a normal blood sugar level in his patients. On the other hand today we are less able to control glycosuria and blood sugar than many would lead us to believe. The textbooks on diabetes and the dictum of various diabetes specialists are distinctly at fault when they state that a normal blood sugar is readily achieved and easily maintained.

The two recent articles from Denmark and Boston, describing the experience with the new insulin product, acknowledge the really existing state of affairs.

The problems we have to solve as best we can are

Is hyperglycemia in the absence of glycosuria harmful?

Is it advisable to stress a normal blood sugar at the risk of hypoglycemic reactions?

Is a high blood sugar at times beneficial and in some cases even a necessity?

Hypoglycemia is a most devastating condition and fraught with a good deal of danger to the individual. I try to avoid such reactions whenever possible in my patients, and it was to obtain the justification of this practice that I have been so interested in finding out whether or not a hyperglycemia was harmful.

A clinician is perfectly justified in basing his conclusions largely on his clinical experience. My observations lead me to believe that hyperglycemia without glycosuria does not harm the patient. This idea was originally developed in the preinsulin period when there were many cases of infection in whom nutrition was of paramount importance. Those cases who received a high diet but not sufficiently high in carbohydrates to produce glycosuria, had their carbuncles, furuncles and infections heal very neatly provided the urine was sugar free although the blood sugar would be high.

I have yet to see a case of diabetic gangrene, cataract or arteriosclerosis where there has not been a preceding period of at least five years in which the diabetes has been carelessly treated, that is one in which there has not been a persistent glycosuria for at least five years. This would indicate that glycosuria and polyuria, that is malnutrition and desiccation, are the causes for complications in the diabetic and not a hyperglycemia without glycosuria.

CLOSING DISCUSSION

DR EDWARD TOLSTOI: Dr Mosenthal had me in mind when he referred to one of the speakers who concurred with Dr Allen's viewpoint fifteen years ago but who has changed his mind. I sincerely hope that Dr Allen does not think me too ungrateful because all my preliminary training and basic training in diabetes has been given me by Dr Allen and I am extremely grateful to him for all of it. I hope he does not think the worm has turned. It is just an evolution of a viewpoint that came upon me from observing a very large number of cases and following those cases very care

fully that I came independently, I may say, to some conclusions of Dr Mosenthal and the other speakers of the evening here. I have one or two remarks that occurred to me when Dr Allen raised certain objections. I will not take up too much time, but I want to reemphasize certain things I have said probably for clarity. Dr Allen stated in the totally depancreatized dog infections supervene while in the dog where even one-twentieth of the pancreas is left, you can operate and have no fear that infection will appear there as readily as in the totally depancreatized dog.

How does that, ladies and gentlemen, apply to pancreatic human diabetes? Do we ever see a case of total pancreatic diabetes in the patient? That is an extreme rarity. I recall only one case in the literature. I don't know how definitely established that was. It is the famous case of Cyril K. We don't see cases of total diabetes. We see some infections, but I don't think, as I stated, they are much more prevalent in these patients than they are in the normal run of people. We are terribly impressed and profoundly so, when the patient sent to us from the skin clinic because of boils or carbuncles reveals a glycosuria, and there is the answer. We immediately connect diabetes with infection. But we forget the case of furunculosis which comes to us and which presents no glycosuria. That just happens to be a case of furunculosis and we let it go at that.

Dr Allen also states that a fat diabetic may show boils. That is very true. I feel in those cases it is not only the diabetes, it is the diabetes and something else. We see that in the older patient and I feel that patient also has vascular lesions.

Gangrene and retinitis. If diabetes or hyperglycemia were responsible for gangrene or retinitis, why is it so infrequent in the young where diabetes is most usually severe. I have asked myself that question repeatedly, and I have yet to find a satisfactory reply. Gangrene and retinitis occur in people who have vascular disease, and whether the diabetes precedes or follows the vascular disease, I am in no position to state, but they are always

found in pairs That is our experience in the clinic, when we see retinitis we see vascular change in the eye Further more, we refuse to call them diabetic retinitis It is vascular disease We see the same type of disease in the eye grounds of some hypertension patients

Dr Allen's point, why not treat heart disease by removing the pancreas Dr Marvin at New Haven has reproduced that but in a simpler way He prefers to give his coronary cases glucose intravenously Tides them over the acute period, and then treats them by the routine method

ERRATA — FELLOWSHIP LIST

ANNUAL REPORT FOR 1935, PUBLISHED IN APRIL, 1936

Through an error the name of Dr Martha Wollstein, a Fellow of the Academy since 1901, was omitted from the list of Non-Resident Fellows Dr Wollstein is at present in Grand Rapids, Michigan

The following are the corrected degrees of Dr Russell Henry Chittenden of New Haven, Honorary Fellow of the Academy Ph D , Sc D , Hon M D , LL D



THE MARTLAND LECTURES

DR HARRISON STANFORD MARTLAND—AN APPRECIATION*

EMANUEL LIBMAN

New York

It is to me a much appreciated privilege to make some introductory remarks on this occasion. Tonight the Essex County Anatomical and Pathological Society inaugurates the Harrison Stanford Martland Lecture, in honor of our friend. It is not usual for a man to be thus honored during his lifetime, and at so early an age. We who know Martland realize that he is richly deserving of the attention that is being shown him.

The course of his medical life has been a rather simple one. After graduation from the College of Physicians and Surgeons, New York, in 1905, he was an interne at City Hospital on Welfare Island for eighteen months. He then spent a period of two years in pathology and bacteriology at the Russell Sage Laboratory. In 1909 he became pathologist to the Newark City Hospital. Until the institution was rebuilt, he worked under most primitive conditions. Since 1925 he has been Chief Medical Examiner of Essex County. He became Associate Professor of Forensic Medicine at the New York University College of Medicine two years ago, and it is expected that he will soon occupy the full professorship formerly held by Dr. Charles R. Norris, to whom he was always so devoted.

Dr. Martland entered the Army in 1917 as a member of the Bellevue Hospital Unit. His services were so distinguished that he was made a Colonel in the Reserve Corps in 1919, and that the Rockefeller Foundation desired him for the directorship of an Institute of Hygiene, to be established for the Government of Mexico.

With such a comparatively simple training has Martland reached his high place among the medical investigators and leaders of the country. What I have already said indicates

* An address delivered on December 14, 1935, at the first Harrison Stanford Martland lecture under the auspices of the Essex County Anatomical and Pathological Society.

that he is a self-made man. He did not need teachers for any length of time. He enjoyed no privileges—he would not want them.

For many years, until 1925, he made but few publications. Since then, there has issued from his pen a series of valuable papers, the most significant being his already classical contributions on the results of intoxication by radioactive substances. Next in importance, perhaps, is the original work on punch drunk, which appeared in 1929.

It is perhaps fortunate that he wrote so little for the first sixteen years of his work here (there is a period of seven years—1909 to 1916—with no publications). He was soaking in valuable observations first hand, at the post-mortem table and in the laboratory. He did not have to confine himself to one or a few subjects. As a result, we find him equally at home in morbid anatomy, pathological histology, forensic medicine, bacteriology, and clinical laboratory methods. As I stated on another occasion, Martland is a master in pathology and a master in forensic medicine. His knowledge of hematology is extraordinary. He has command of and has made good use of the experimental method.

The museum of the City Hospital, built up by him, is one of the most valuable in the country. Dr. Martland does practically all of the work himself. He makes his own drawings and illustrations. He has the knack of demonstrating what is to be shown, and very clearly. The atmosphere of his laboratory is that of a university, and not that of the usual municipal hospital.

Martland is an unceasing worker. There is no difference, in his laboratory, between weekdays and Sundays, or work days and holidays. Even today, the best chance of finding him late at night is at the laboratory. It has always been a mystery how he succeeds in doing so much, and how it is that his loyal, sterling associates have not succumbed.

To make the situation more remarkable, he finds time for extensive court work, preparation of numerous papers, appearances at medical meetings, crime conferences, etc., and for much activity on behalf of the New York Academy

of Medicine There he is Secretary of the Committee on Admission and Director of the Scientific Exhibits for the Graduate Fortnights I need not tell you what he has done for the Fortnight—the fame of the exhibits is widespread The Academy and the profession at large are under a real debt to him

As a teacher, Martland is outstanding and *sui generis* Not given to formal methods, he is a great teacher In fact, he cannot help imparting knowledge After years of almost complete silence, he has begun to teach in connection with exhibits He has given many exhibits of his own observations and studies at the Academy and at numerous meetings, especially of the American Medical Association and your own State Society You cannot be in Martland's laboratory for five minutes without learning something I have often looked forward to spending some months following him about, in order to imbibe some of his large store of special knowledge

Dr Martland could have done formal teaching, for he has refused a number of important academic positions, some already offered many years ago But he is too much attached to his work here, his home city, to have any willingness to go elsewhere The only possibility of his being taken away, I believe, would be the creation of a medicolegal institute which would serve as a center for education in forensic medicine for the country at large, and which could lead to a wiping out of the obsolete coroner system, still so prevalent The acceptance of such a post he would look upon as a solemn duty And it may be said truly, that in the present generation, the future of forensic medicine in this country is dependent upon Martland more than upon any other man

There is much to say of Martland, the man, but it is unnecessary that it all be told on this occasion For you are his associates and friends, and there must be good reason why you all, close to him for so many years, love him—and why Dr Welch, after attending one of his demonstrations at the New York Academy of Medicine, wrote to me, "Martland is a joy to meet"

I would like to say something of a few qualities of Dr Martland. First, his naturalness, and his love of the truth. He knows the truth in a medical problem, and knows it in relation to human beings. I have never heard him tell even a "white lie," and you know how rare such beings are. Then comes his modesty. I cannot resist telling a significant story about that. On October 8, 1925, when he was scheduled to speak on his work on intoxication by radioactive substances at a meeting of the New York Pathological Society, he was accompanied by his and your friend Staehelin. You all remember Staehelin, that scholarly man, that beautiful character. When they arrived in New York Martland wanted to return to Newark, because he felt that his work was not worthy of presentation. I was ill at the time. Under the guise of a sick call, Staehelin induced him to come to my home. It was only with the greatest pressure that we succeeded in getting him to go to the Academy, where his work was acclaimed.

It is not generally known that Martland manages to find time for some clinical work and that he is an able clinician, with a fine knowledge of electrocardiography, roentgenological diagnosis, and other accessory clinical methods. You men of Essex County have for years been going to him for advice as to your cases. You have also gone to him for advice in your difficulties, and have indeed made him your leader in all things. And here we have the essence of all that Martland has, is, and will be doing for all the years to come. The secret of Harrison Martland's influence lies in his love for his fellow men. He knows superiors, but recognizes none as inferiors.

Members of the Essex County Anatomical and Pathological Society. You have done a fine deed in establishing the Harrison Stanford Martland Lecture. You have honored the community and yourselves by the respect that you show to a worthy comrade. By the choice of the first lecturer, you have indicated in what high regard the Martland Lecture will be held by you. I congratulate Martland and you, and extend my best wishes for all your future activities.

INTRODUCTION OF GEORGE HOYT WHIPPLE, M D *

FREDERIC SONDERN

New York

There are few as well suited for the introductory "Harrison S Martland Lecture" as the guest speaker of the evening. The Essex County Anatomical and Pathological Society is indeed fortunate both in the selection of the man whose name is honored by this group of lectures and the first essayist of this series.

George Hoyt Whipple was born in that part of New England noted for intrepid men, of whom Calvin Coolidge was an example.

He came out of Yale University a Doctor of Philosophy, a college whose graduates with that degree rank foremost both in science and industry. His medical education was obtained at Johns Hopkins at a time when that mentor William H. Welch was the life of pathology in this country and its most worthy exponent as the basis of scientific medicine. To mention "Popsie" Welch is to think of him that intimately, and to suppress a pang at the recollection of his passing. It reminds me of a birthday celebration of his, I think it was the eightieth, which was sponsored by President Hoover in Washington. Two addresses on that occasion stand out in my memory. One, Simon Flexner's eulogy on Welch's personal magnetism and modesty, his scientific profundity and his teaching ability. The other, Dr. Welch's response, replete with gratitude to his own teachers abroad coupled with the hope that he had emulated them at home. George H. Whipple is the proof that he did. A favorite student and later the assistant of Welch, inspired early by that master teacher to interest in pathology, he is devoting his life to it. The bone marrow, the liver and the blood are the favorite subjects of his research activities.

After leaving Hopkins, the Ancon Hospital under Goigas, and the Bayside Hospital in Baltimore, he became professor of research medicine at the University of Cali-

* Dr. Whipple is Dean of the Medical School of the University of Rochester, and was the first lecturer in the Harrison Stanford Martland Series, under the auspices of the Essex County Anatomical and Pathological Society, on December 14, 1935.

of any iron store in the liver. As the iron feeding experiments are lengthened, we see a variable accumulation of iron in the liver, but the amounts are small and a very rapid appearance of the iron in matured hemoglobin is the conspicuous feature.

The importance of blood-free organs is stressed, and other method difficulties are discussed.

Parenchyma iron of various blood-free organs is relatively a constant in these dogs. Liver, kidney, and pancreas average 1 to 2 mg per 100 grams of iron, the lung is a little higher, or 3 mg, the spleen is still higher, or 5 to 6 mg. The red marrow apparently has the highest level of parenchyma iron—an uncertain figure, but probably in excess of 10 mg Fe per cent per 100 grams of iron. The striated muscles actually rate with the liver and kidney, although the average for total contained iron is 3.1 mg per 100 grams of iron. About 1.6 mg iron is muscle hemoglobin iron, leaving the parenchyma iron as 1.5 mg.

Muscle hemoglobin iron and muscle parenchyma iron are inviolate stores of iron which are not drawn upon no matter how great is the emergency due to anemia. Conversely no surplus iron can be demonstrated in this tissue where iron is given intravenously.

Iron depletion can be carried to a point where there is almost a complete cessation of hemoglobin production in a standard dog on a diet very poor in iron.

Intravenous iron in the doses given will result in large storage in the liver and spleen—55 to 70 per cent of the total iron given. We are not prepared to say where the remaining iron is to be located in the body tissues or fluids, but it certainly is not eliminated.

In his early work, Dr. Whipple noted that dogs with abnormal conditions such as acute and chronic infection, and liver injury, did not regenerate hemoglobin to the same extent as dogs without these abnormal states. Later experiments about to be published elsewhere demonstrate that infection disturbs the utilization of iron and accounts for the failure of iron therapy in anemias due to infection.

BOOK REVIEW

THE JEFFERSON-WATERHOUSE CORRESPONDENCE ON VACCINATION*

1800-1803

From most casual beginnings we now have in orderly arrangement, with scholarly background and direct documentary evidence, a charming and vivid story of the vicissitudes, and triumph in this country of the most nearly perfect public health procedure in all history

An idle but inquisitive moment at Charlottesville, Va, tempted our colleague, Dr Halsey, to follow the dusty trail of forgotten letters from and to the most intellectually gifted of our Presidents, and to and from that remarkable, imaginative, yet critical and tenacious physician, Dr Benjamin Waterhouse of Boston

After a brief biographical sketch of the two correspondents, so far as necessary to involve them and their families in the conspiracy to test, prove successful and promote vaccination with the "kine pox" in the states of the nation, Dr Halsey reveals the trials of the outlander who intrudes upon the complacent competence of Boston's medical and social circles with heterodox ideas and proposals

From that day in June, 1800, when some "matter" was received from Dr John Haygarth of Bath, until March 1, 1803, we can follow the course of progress from doubt and distrust to international acceptance of the safeguarding inoculations

The President and Dr Waterhouse, and Dr Jenner and some of his British contemporaries all discuss in the quoted letters, with reason, insight and public spirit, the implication, hopes, hazards and ultimately convincing proofs involved in the trial and practice of vaccination

Justly and with good cause does our practitioner historian of today pay tribute in his closing paragraph to the

*Halsey, R H *How the president, Thomas Jefferson, and Doctor Benjamin Waterhouse established vaccination as a public health procedure* New York, The Author, 1936 (History of medicine series, issued under the auspices of the Library of The New York Academy of Medicine No 5)

notable leadership of the zealous though never fanatical Dr Waterhouse

"To Dr Waterhouse is due, therefore, the credit of devising the method, and inviting Jefferson to lend his influence in the execution of the procedure and thus expediting the introduction of vaccination as a preventive of smallpox and establishing it as a recognized public health measure "

HAVEN EMERSON

RESOLUTIONS OF THE COUNCIL PASSED APRIL 22, 1936, ON THE DEATHS OF ARTHUR B DUEL AND HARLOW BROOKS

ARTHUR BALDWIN DUEL

The Council of The New York Academy of Medicine records with deep feeling its sense of loss in the death on April 11, 1936 of Dr Arthur B Duel who for many years had been a member of the Council

Dr Duel was elected a Fellow of the Academy in 1899. At that time, he was actively interested in everything pertaining to the advancement of the practice of medicine. He was engaged in hospital work, particularly in the field of otolaryngology and did much toward raising the standards of practice in this field. He was not satisfied with being a local influence only, but rapidly took his place as a leader nationally and internationally. His work in connection with the repair of the facial nerve done in association with Sir Charles Ballance was of the highest scientific order and gained him an international reputation.

With these many activities, he never failed to carry his responsibilities as a Fellow of the Academy in full measure. He was one of those who early visualized the enlarged usefulness that the Academy might attain. It was by his efforts that one of the major contributions was secured which enabled the Academy to own and work in its present beautiful home. For this work to be effectively carried forward, it was necessary that a man of outstanding ability and experience be secured as its Director. It was Dr Duel who recognized in Linsly Williams a man specially quali-

fied for this position, and the record made under Dr Williams' administration is well known

As a member of the Council, during the years he was a Vice-President, and as a Trustee, Dr Duel was unfaltering in his continued interest, wise counsel and active work

The Academy through its Council records the deep sense of loss that has been sustained—a loss which is felt as a personal one by all those who were associated with Dr Duel in his work

The Council orders that this resolution be spread upon its minutes and a copy thereof presented to his family

HARLOW BROOKS

Dr Harlow Brooks died on April 13, 1936 in the very height of his professional activity. In his death, The New York Academy of Medicine has suffered an irreparable loss

Throughout his life he was one of the outstanding men of his profession in the fields of general medicine and medical education

He was elected a Fellow of the Academy in 1904 and from the very first became a dominant factor in its work. Dr Brooks was particularly interested in the education of the general practitioner. He devoted a major portion of his time to teaching in the hospitals and medical colleges. His following was very large and very personal. His personality impressed itself upon those with whom he worked and scores of physicians are more capable because of what they learned from Dr Brooks.

He accepted with real seriousness his responsibility as a Fellow of the Academy, served on many of its committees, became Chairman of the Committee on Medical Education, and was elected a Vice President in 1932. In all of these positions, he gave freely of his time and his matured judgment in advancing the interests of the Academy and through it of the medical profession. Those who were intimately associated with him in this work feel a deep sense of loss which it is difficult to express.

The Council of the Academy records its great appreciation of his accomplishments and its sorrow in that the Academy is to be deprived of his services and engaging personal association. It is ordered that this resolution be spread upon the minutes and a copy thereof presented to his family

ARTHUR BALDWIN DUEL 1870 - 1936

Arthur Baldwin Duel died at Laurelwood, his country place near Pawling, New York, on the eleventh of April last. He was born at Granville, New York on December 14, 1870 and was educated in its preparatory schools and at the University of Vermont. He then entered Harvard Medical School from which he graduated cum laude in 1894. After a year's internship at the Boston City Hospital he came to New York and joined the surgical staff of the Manhattan Eye, Ear and Throat Hospital in November, 1895. At this time he did work in pathology at the New York Post Graduate Hospital and was from 1896 until 1900 connected with the Aural Department of The New York Eye and Ear Infirmary. He was for some time Professor of Otology at the New York Polyclinic Medical School and Hospital, and at the time of his death was Senior Aural Surgeon, Chairman of the Board of Surgeon Directors and Vice President of the Manhattan Eye, Ear and Throat Hospital. He was Consulting Otologist to the New York Board of Health and the Willard Parker Hospital, The Babies Hospital, The New York Skin and Cancer Hospital and The Englewood Hospital at Englewood, N. J. He was elected to Fellowship in The New York Academy of Medicine in 1899 and was Secretary of its Section of Otology in 1903 and Chairman of that Section in 1908, Chairman of the Building Committee from 1923 to 1933. He was Vice President in 1922 and 1923 of The New York Academy of Medicine and Trustee from 1924 until the time of his death, a former President of the American Otological Society and Chairman of its Research Committee for Otosclerosis, former President of the New York Otological Society, Fellow of the International Collegium Otolaryn-

gologicum, and Honorary Fellow of the Société de Laryngologie des Hôpitaux de Paris, Fellow of the American College of Surgeons, The American Laryngological, Otological and Rhinological Society and the American Medical Association and State Societies

He made many contributions to Otological literature and contributed "Otology" to *Progressive Medicine* 1907-14, "Otology" in Billings-Forsheimer's *Therapeutics of Internal Disease* (George Blumer edition) 1924

His last and chief work was begun in collaboration with Sir Charles Ballance in 1930 for the relief of Facial Palsy. Through appropriations from the Carnegie Research Fund and through the generosity and loyalty of his friends and former patients a laboratory was established at his country place where for several years the experimental research was carried on which ultimately led to the operation for decompression of the facial nerve in certain cases of paralysis and for the use of autoplasmic nerve grafts in others where a portion of the nerve had been destroyed. He was called to describe his work before the scientific societies of his specialty in this country and abroad. In Brazil he was accorded Honorary Membership in the Associao Paulista de Medicina at Sao Paulo, and he presented his work as a member of the International Collegium Otolaryngologicum at Stockholm. He also responded to an especial invitation to lecture before the Royal College of Surgeons in London and to demonstrate his operation in several hospitals in England.

He was untiring in his work and unsparing in his efforts for the advancement of Otology, and his interest in both its clinical and laboratory study was an inspiring aid to his hospital associates and to his fellow members in the councils of the Scientific Societies to which he belonged.

His strength of character, sound judgment and conscientious devotion to his work was combined with rare generosity of spirit and personal charm. His memory is cherished by all who worked with him and learned from him, and by hundreds who are grateful to his unfailing kindness and skill.

JOHN RANDOLPH PAGE

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PROCEEDINGS OF ACADEMY MEETINGS

MARCH

STATED MEETINGS

Program arranged in cooperation with the

SECTION OF HISTORICAL AND CULTURAL MEDICINE—March 5

I EXECUTIVE SESSION—*a* Reading of the minutes *b* Election of Members

Scientific Program

II PAPERS OF THE EVENING—*a* William Cheselden some of his contemporaries and their American pupils before the Hunters Francis R. Packard Editor Annals of Medical History Discussion Fenwick Beckman *b* The medical work of the Knights of St. John of Jerusalem Edgar Erskine Hume, Librarian Army Medical Library Discussion James J. Walsh

III EXECUTIVE SESSION—SECTION OF HISTORICAL AND CULTURAL MEDICINE—*a* Reading of the minutes *b* Report of Nominating Committee

THE HARVEY SOCIETY (*in affiliation with THE NEW YORK ACADEMY OF MEDICINE*)
March 19

THE SIXTH HARVEY LECTURE The Influenzas of Swine and Man, Dr. Richard E. Shope Associate Member Department of Animal and Plant Pathology The Rockefeller Institute Princeton

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY—March 3

I READING OF THE MINUTES

II PRESENTATION OF CASES—*a* New York Polyclinic Hospital *b* City Hospital *c* Miscellaneous cases

III DISCUSSION OF SELECTED CASES

IV EXECUTIVE SESSION—Appointment of Nominating Committee

COMBINED MEETING OF THE NEW YORK NEUROLOGICAL SOCIETY and the SECTION OF NEUROLOGY AND PSYCHIATRY—March 3

I PAPERS OF THE EVENING—*a* A pathognomonic encephalographic sign of chronic subdural hematoma Cornelius G. Dyke Discussion S. P. Goodhart E. A. Friedman *b* The treatment of obstructive hydrocephalus by third ventriculostomy Report of two cases John E. Scarff Discussion Byron Stookey Foster Kennedy *c* On the site of action of acetylcholine and its significance Harold G. Wolff (by invitation) Discussion James McKeen Cattell Frank Pike Byron Stookey Smith Ely Jelliffe Joshua Leiner Foster Kennedy *d* Varieties of aggression in parenthood Gregory Zilboorg Discussion Smith Ely Jelliffe Bernard Sachs Reuben Gerber

II EXECUTIVE SESSION—Section of Neurology and Psychiatry—Appointment of Nominating Committee

SECTION OF SURGERY—March 6

- I EXECUTIVE SESSION—a Reading of the minutes b Appointment of Nominating Committee
- II CASE PRESENTATIONS—a Compound fracture of the skull six months after injury b Compound fracture of the tibia and fibula six years after injury Henry H Ritter c Fracture of humerus through an area of osteomyelitis A O Wilensky Discussion J R Lincoln W T Doran R Kennedy
- III PAPERS OF THE EVENING—a Osteomyelitis of the skull Joseph E J King Discussion W T Doran b The treatment of osteomyelitis A O Wilensky Discussion J R Lincoln Kenneth Lewis H H Ritter c The management of compound fractures Henry H Ritter Discussion Frederic Bancroft Kenneth Lewis Henry Ritter d Osteomyelitis in compound fractures Robert H Kennedy Discussion Frederic Bancroft Kenneth Lewis Henry H Ritter
- IV GENERAL DISCUSSION

SECTION OF OPHTHALMOLOGY—March 16

- INSTRUCTIONAL HOUR 7 00 8 00 p m—Etiology and non operative treatment of glaucoma Mark J Schoenberg
- SLIT LAMP—Demonstration of cases 7 30 8 30 p m—Milton L Berliner Girolamo Bonacalto Gordon M Bruce Wendell L Hughes
- EXHIBIT 7 30 8 30 p m— The Embryology of the Human Eye Brittain F Payne (by invitation)

Scientific Program

- I Executive Session—a Reading of the minutes b Election of Member of Advisory Committee (for one year and two months) to fill the unexpired term of Herbert W Wootton resigned Nominee Clyde E McDannald c Appointment of Nominating Committee
- II Presentation of instrument—an improved perimeter—campimeter Joseph I Pascal (5 minutes) (by invitation)
- III Report on exhibit on the embryology of the eye Brittain F Payne (10 minutes)
- IV Case Presentations—a The Young ptosis operation—report of a case Willis S Knighton (5 minutes) b Bilateral cyst of the vitreous—report of a case Charles A Perera (10 minutes) (by invitation)
- V Paper of the Evening—Orbital tumors C S O'Brien (20 minutes) Iowa City Iowa (by invitation) Discussion John M Wheeler Bernard Samuels

JOINT MEETING—SECTION OF MEDICINE and the NEW YORK HEART ASSOCIATION

March 17

- I PAPERS OF THE EVENING—a The management of rheumatic heart disease Lucy Porter Sutton (40 minutes) Discussion Homer F Swift (7 minutes) Irving R Roth (7 minutes) b The clinical significance of the measurement of circulation time Arthur M Fishberg Discussion Harold G Stewart
- II EXECUTIVE SESSION—Section of Medicine—Appointment of Nominating Committee

SECTION OF GENITO URINARY SURGERY—March 18

- I EXECUTIVE SESSION—a Reading of the minutes b Appointment of Nominating Committee
- II PRESENTATION OF CASES—a Neurofibromatosis of the bladder and prostate Case report C H McDonnell Ann Arbor Mich (by invitation) b Transurethral resection of bladder tumors Case reports John A Taylor
- III PAPERS OF THE EVENING—a The ectopic ureteral orifice A study of fifteen cases in children Meredith F Campbell b Clinical and experimental study of lithotripsy Francis Patton Twinem Discussion by Simon A Beisler Paul M Butterfield Abraham Hyman
- IV GENERAL DISCUSSION—Henry Dawson Furniss Russell Ferguson

SECTION OF OTOLARYNGOLOGY—*Program presented in conjunction with* THE SECTION OF OTOLARYNGOLOGY OF THE PHILADELPHIA COLLEGE OF PHYSICIANS—March 18

- I READING OF THE MINUTES
- II PRESENTATION OF CASES AND NEW INSTRUMENTS—*a* Laryngectomized patients phonating without mechanical aid George Reofrew Brighton *b* Nerve stimulator Edmund Prince Fowler *c* Demonstration of new type of tracheotomy tube John S Mikell (by invitation)
- III CASE REPORTS—*a* 1 Cyst of larynx, 2 Actinomycosis, John Devereux Kernan, Discussion by Louis Henry Clerf (by invitation) *b* Congenital stenosis of larynx, George Hunter O Kane (by invitation) Discussion by Chevalier Lawrence Jackson (by invitation)
- IV PAPERS OF THE EVENING—*a* Non malignant tumors of larynx George Renfrew Brighton, Sylvester Daly (by invitation), Discussion by Gabriel Tucker (by invitation) *b* Radiotherapy in otolaryngology, Maurice Lenz, Discussion by Eugene Percival Pendergrass (by invitation), *c* Acoustic neuromas Edmund Prince Fowler, Jr (by invitation) Discussion by Benjamin Harrison Shuster (by invitation)
- V GENERAL DISCUSSION—Clinical demonstrations and lectures were held at The Columbia Presbyterian Medical Center, 168 Street and Broadway from 2 to 6

SECTION OF ORTHOPEDIC SURGERY—March 20

- I READING OF THE MINUTES
- II PAPERS OF THE EVENING—*a* Fractures of the ankle Kenneth M Lewis *b* Some principles in treatment of fractures about the shoulder, Clay Ray Murray, *c* 1 Functional method of treating humeral shaft fractures 2 Ambulatory method of treating femoral shaft fractures, Roger Anderson Seattle (by invitation)
- III GENERAL DISCUSSION
- IV EXECUTIVE SESSION—Appointment of Nominating Committee

SECTION OF OBSTETRICS AND GYNECOLOGY—March 24

- I PRESENTATION OF CASE REPORT AND PATIENT—Sacrococcygeal transrectal repair of high rectovaginal fistula incidental to sacral Mikulicz Vorlagerung for rectosigmoidal carcinoma John C A Gerster Discussion opened by Raymond R Squier (by invitation) Royal C Van Etten, David N Barrows
- II PAPERS OF THE EVENING—*a* Primary ovarian pregnancy with report of an interesting case Mortimer N Hyams, Discussion opened by Anthony Wollner, Ward J McNeal, *b* The blood oestrin test of Frank and Goldberger Theodore Neustaedter Discussion opened by Gertrude Felshin *c* The care and feeding of the newly born Charles Hendee Smith, Discussion John Taylor Howell Jr, Hugh Chaplin
- III GENERAL DISCUSSION

COMBINED MEETING OF THE NEW YORK PATHOLOGICAL SOCIETY and the
SECTION OF PEDIATRICS—March 26

- I SYMPOSIUM ON SPLENOmegALY IN CHILDHOOD—*a* Pathological aspects, Paul Klemperer *b* Clinical aspects Rustin McIntosh
- II DISCUSSION—Margit Freund, David Perla Maurice N Richter, Nathan Rosenthal, William P Thompson
- III EXECUTIVE SESSION—Section of Pediatrics—Appointment of Nominating Committee

AFFILIATED SOCIETIES

NEW YORK ROENTGEN SOCIETY in affiliation with THE NEW YORK ACADEMY OF MEDICINE
March 16

- I PAPERS OF THE EVENING—*a* Etiology of silicosis and its medico legal considerations, Harrison S Martind, Newark (by invitation), *b* Roentgen findings in silicosis, Raphael Pomeranz, Newark (by invitation)

II DISCUSSION—J Burns Amberson Wm Cole L J Goldwater

III EXECUTIVE SESSION

NEW YORK MEETING of the SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

March 18

- I Differential bile acid analysis in various pathological conditions H Doubilet R Colp (Introduced by L Gross)
- II Anaphylaxis and cerebral allergy in the monkey (*Macacus rhesus*) N Kopeloff L M Davidoff L M Kopeloff
- III Effect of extirpation of pituitary gland on arterial blood pressure of dogs with experimental hypertension I H Page J E Sweet
- IV Some effects of hypophysectomy on the reproductive system and its responses to ovarian hormone in Rhesus monkeys P E Smith H H Tyndale E T Eogle
- V Effect of hypophysectomy on blood sugar of Rhesus monkeys P E Smith L Dotti H H Tyndale E T Engle
- VI Functional auto and homoplastic thyroid grafts in the rat T N Salmon A E Severinghaus
- VII Gangrenous and ulcerative lesions of the toes following injections of tobacco in rats M Friedlander S Silbert N Laskey (Introduced by L Gross)
- VIII Role of pepsin in experimental production of gastric ulcer in rats M J Matzner C Windwer A E Sobel S H Polayes (Introduced by B Kramer)
- IX Multi plane chest electrocardiography J Weinstein (Introduced by M A Rothschild)

NOTICES

SECTION OF HISTORICAL AND CULTURAL MEDICINE

As the Section arranged the program of the Stated Meeting of the Academy for March 5 the regular meeting was not held on March 11

SECTION OF PEDIATRICS

The regular meeting of the Section of Pediatrics was not held on March 12th Instead the Section held a combined meeting with the New York Pathological Society on March 26th

APRIL

STATED MEETINGS

April 2

- I EXECUTIVE SESSION—a Reading of the Minutes b Election of Members
- II PAPERS OF THE EVENING—A STUDY OF THE DISEASES AMENABLE TO SPLENECTOMY—
 - a The advantages of the combined clinic in middle ground disease Allen O Whipple b Idiopathic thrombocytopenic purpura A review of 25 cases with the results of splenectomy Daniel Brown R H E Elliott Jr c The role of congestion (portal hypertension) in the Banti syndrome and the response to splenectomy L M Rousselot d Hemolytic jaundice—its recognition treatment and behavior W P Thompson

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)

April 16

THE SEVENTH HARVEY LECTURE Malignant Cells Warren H Lewis Research Associate Carnegie Institution of Washington Professor of Physiological Anatomy Johns Hopkins University

SECTION MEETINGS

COMBINED MEETING OF SECTION OF SURGERY AND SECTION OF PEDIATRICS—April 3

I READING OF THE MINUTES

II PRESENTATION OF CASES—Two cases of mesenteric lymphadenitis Henry W Cave

III PAPERS OF THE EVENING—*a* Acute mesenteric lymphadenitis simulating acute appendicitis Henry W Cave Robert Shaw (by invitation), Discussion Edward W Peterson Murray H Bass Edward J Donovan, *b* Hirschsprung's disease Edward W Peterson Discussion Edward J Donovan Sidney V Haas George D Scott *c* Anomalies of structure and derangement of function in the gastrointestinal system in children Charles Gilmore Kerley Discussion John Caffey

IV DISCUSSION—Murray H Bass, John Caffey

V EXECUTIVE SESSION—Nomination of Section Officers and one Member of Advisory Committee

SECTION OF DERMATOLOGY AND SYPHILOLOGY—April 7

I READING OF THE MINUTES

II PRESENTATION OF CASES—*a* New York Hospital & Cornell Medical College *b* Miscellaneous cases

III DISCUSSION OF SELECTED CASES

IV EXECUTIVE SESSION—Nomination of Section Officers and one member of Advisory Committee

SECTION OF NEUROLOGY AND PSYCHIATRY—April 14

I CASE PRESENTATIONS—*a* Extradural lipoma compressing the spinal cord Anatole Kolodny (by invitation) Discussion, Herman Schwartz R Cohen *b* Cervical cord tumor resembling combined system disease E D Friedman Discussion Foster Kennedy Henry Alsop Riley

II PAPERS OF THE EVENING—*a* The toruli infection of the central nervous system S Philip Goodhart Charles Davison Discussion Henry Alsop Riley S W Gross Leon H Cornwall *b* Behavior problems in children of psychotic parents Lauretta Bender Discussion Justice Jacob Panken of the Childrens Court (by invitation) Florence Powdermaker (by invitation) *c* The prepsychotic personality of the anxious agitated depression Wm B Titley (by invitation) Discussion Philip R Lehrman

III EXECUTIVE SESSION—*a* Report of Resolutions Committee *b* Nomination of Section Officers and one member of Advisory Committee

SECTION OF OTOLARYNGOLOGY—April 15

PROGRAM PRESENTED BY THE STAFF OF OTOLARYNGOLOGY OF THE NEW YORK HOSPITAL

I READING OF THE MINUTES

II PRESENTATION OF MEMORIAL FOR EDWARD BRADFORD DENCH by Thomas J Harris

III PRESENTATION OF CASES—ILLUSTRATING THE PAPERS OF THE EVENING—*a* The incidence of sinusitis and nasal polypi in bronchial asthma Samuel F Kelley (by invitation) Discussion by John D Kernan *b* Recurrent lipoma myxochondroma fibroma of larynx Arthur Palmer *c* Demonstration of ear drum models Gervais W McAuliffe *d* The effect of intranasal phenol application in hay fever quantitatively studied by intranasal swab tests with pollen extracts Fernand Vistreich (by invitation) *e* Roentgen ray therapy of carcinoma of the nose and throat Alfred F Hocker (by invitation) Discussion by Henry H Forbes Marvin F Jones

IV EXECUTIVE SESSION—Nomination of Section Officers and one member of Advisory Committee

SECTION OF GENITO URINARY SURGERY—April 15

I READING OF THE MINUTES

II PRESENTATION OF NEW INSTRUMENT—A new self lubricating catheterizing forceps, Raymond E Tynd Dayton Ohio (by invitation)

III PRESENTATION OF CASES—Suprarenal tumors A report of two cases Howard S Jeck E Hall Kline Nyack N Y (by invitation)

IV PAPERS OF THE EVENING—*a* Precancerous dermatosis of the penis with the presentation of a case Archie L Dean Jr Joseph H Farrow (by invitation) Discussion by Marion B Sulzberger *b* Pelvic plication in the treatment of hydronephrosis

Seymour F Wilhelm George Blinick (by invitation) Discussion by George Cahill
Oswald Swinney Lowsley John H Morrissey

V GENERAL DISCUSSION—Stanley R Woodruff Thomas J Kerwin

VI EXECUTIVE SESSION—Nomination of Section Officers and one member of Advisory Committee

SECTION OF ORTHOPEDIC SURGERY—April 17

I READING OF THE MINUTES

II PRESENTATION OF CASES—*a* Arthroplasty of the knee Samuel A Jahss (by invitation)
b Arthroplasties of the hip Halford Hallock *c* One good and one bad arthroplasty of the knee Joseph E Milgram (by invitation) *d* Arthroplasties of the knee hip and elbow Joseph B Lepiscopo *e* Cases illustrating one of the papers of the evening Samuel Kleinberg

III PAPERS OF THE EVENING—*a* Arthroplasties of the lower extremity Samuel Kleinberg
b Arthroplasties of the elbow Sumner L Roberts Boston (by invitation) Philip D Wilson

IV GENERAL DISCUSSION

V EXECUTIVE SESSION—Nomination of Section Officers and one member of Advisory Committee

SECTION OF OPHTHALMOLOGY—April 20

INSTRUCTIONAL HOUR 7 00 8 00 p m—The operative treatment of glaucoma Webb W Weeks

SLIT LAMP DEMONSTRATION OF CASES—Milton L Berliner Girolamo Bonaccalto Gordon M Bruce Wendell L Hughes

REGULAR PROGRAM

I EXECUTIVE SESSION—*a* Reading of the Minutes *b* Nomination of Section Officers and one member of Advisory Committee

II REPORT OF CASES—*a* Simple conjunctival suture for cataract section S A Agatston
b Two tumors of the eye 1 Amputation neuroma of the long posterior ciliary nerve 2 Plexiform neuroma of the choroid in a non buphthalmic eye L H Meeker

III PAPER OF THE EVENING—Fundus lesions in essential hypertension and arterial and renal diseases Martin Cohen Discussion H O Mosenthal W W Herrick A J Bedell David Wexler

SECTION OF MEDICINE—April 21

I PAPERS OF THE EVENING—SYMPOSIUM—RECENT ADVANCES IN HEMATOLOGY—*a* Biological and chemical studies in pernicious anemia Bernard M Jacobson Boston (by invitation) (30 minutes) Discussion Randolph West (5 minutes) Guy Clark (by invitation) *b* The use of placental extract in hemophilia R Cannon Eley, Boston (by invitation) (30 minutes) Discussion William P Thompson (5 minutes) Francis Wright (by invitation) Carl Smith *c* The use of moccasin venom in bleeding Samuel M Peck (30 minutes) Discussion Nathan Rosenthal (5 minutes) Cornelius P Rhoads (5 minutes) William Thompson

II Nomination of Section Officers and one member of Advisory Committee

SECTION OF OBSTETRICS AND GYNECOLOGY—April 28

PROGRAM ARRANGED BY THE STAFF OF THE SLOANE HOSPITAL FOR WOMEN

I EXECUTIVE SESSION—*a* Nomination of Section Officers and one member of Advisory Committee *b* Other business

II PRESENTATION OF CASE REPORTS—*a* Marsupialization of inoperable ovarian cysts with case reports Harbeck Halsted *b* 1 Unusual case of Krukenberg tumor 2 Spontaneous rupture of heart in new born John H Boyd (by invitation)

III PAPERS OF THE EVENING—*a* Methods for control of morbidity in obstetrical practice D Anthony D Esopo (by invitation) *b* Excessive uterine bleeding of functional origin Raphael Kurzrok Leo Wilson *c* X ray studies of the mechanism of labor William E Caldwell Howard C Moloy (by invitation) *d* Pessary treatment of

retroversion and retroflexion of the uterus, William M Findley (by invitation) c The mortality following hysterectomy for fibromyomatous tumors, James A Corscaden

IV GENERAL DISCUSSION

AFFILIATED SOCIETIES

NEW YORK MEETING OF SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE—April 15

- I A simple method for determination of ethyl alcohol in blood, J C Abels (Introduced by I Greenwald)
- II Subcutaneous temperatures in localized infections, J H Conway (Introduced by P Reznikoff)
- III Cultivation of poliomyelitis virus *in vitro* in human embryonic nervous tissue A B Sabin P K Olitsky
- IV Absorption through the nasal mucosa of mice G Rake
- V Hemorrhagic necrotic skin lesions in rabbit produced by *Hemophilus influenzae* and *Hemophilus pertussis*, E Witebsky H Salm
- VI Prolonged injection of a thyrotropic extract without development of refractoriness, S C Werner (Introduced by P E Smith)
- VII Quantitative relation between follicle stimulating and luteinizing effects in castrate and menopause urine, U J Salmon, R T Frank
- VIII Relation of the cholane nucleus to the female bitterling test for male hormone I S Kleiner A I Weisman, D I Mishkind

NEW YORK ROENTGEN SOCIETY in affiliation with THE NEW YORK
ACADEMY OF MEDICINE—April 20

- I Roentgen therapy of vomiting in infants Theodore West (10 minutes)
- II PAPERS OF THE EVENING—a The acute abdomen Intra intestinal and extra intestinal gas Charles S B Cassasa (by invitation) Discussion, Ross Golden Paul Swenson
b Mechanical factors in acute respiratory disease of infants with special reference to obstructive emphysema and atelectasis William Snow Discussion, Solomon Weintraub (by invitation)
- III EXECUTIVE SESSION

NEW YORK PATHOLOGICAL SOCIETY in affiliation with THE NEW YORK
ACADEMY OF MEDICINE—April 23

- I CASE REPORTS (PRESENTATION OF GROSS SPECIMENS)—a Dermoid cyst of ovary with squamous cell carcinoma b Oophoroma folliculare (Brenner) of ovaries, L H Meeker c Pedunculated subserous myo sarcoma of stomach with fatal hemorrhage, A J Fried
- II PAPERS OF THE EVENING—a Anaplastic carcinoma of vestibular (Bartholin) gland, S M Rabson L H Meeker b Congenital defect of heart (cor trilobulare biven triculosum) L H Meeker M M Maliner (by invitation)
- III EXECUTIVE SESSION

DEATHS OF FELLOWS OF THE ACADEMY

BARANY, ROBERT, M D, Upsala, Sweden, graduated in medicine from the University of Vienna in 1900, elected an Honorary Fellow of the Academy November 18, 1926, died April 8, 1936

Dr Barany received the 1914 Nobel award for medicine for his investigations in physiology

He was professor of otology, rhinology and laryngology at the University of Upsala, Upsala, Sweden

BROOKS, HARLOW (HENRY) M D, 47 West 9 Street, New York City, graduated in medicine from the Department of Medicine and Surgery, University of Michigan 1895, elected a Fellow of the Academy March 3, 1904, died April 13, 1936

Dr Brooks was attending physician to Bellevue Hospital and consulting physician to St Vincent's, City, Montefiore, Joint Disease, Fifth Avenue, French, Polyclinic, Beth Israel, Ossining, Union, St John's, St Joseph's, Yonkers, Mt Vernon, Flushing, Greenwich (Conn), Hackensack and Norwegian Hospitals

He was president of the American College of Physicians from 1920-1922 and president of the New York Pathological Society from 1900-1901 He was a Fellow of the American Medical Association, a member of the Association of American Physicians, American Gastro-enterological Society, American Association of Pathologists and Bacteriologists, Harvey Society, American Museum of Natural History, Association for the Advancement of Science, Society for Experimental Biology and Medicine, Alumni Association of City Hospital, Alumni Association of Montefiore Hospital, Society of Alumni of Bellevue Hospital, the County and State Medical Societies, and an Honorary Fellow of the New York Zoological Society

In 1931, Dr Brooks received the honorary degree of Master of Science from the University of Michigan He made many contributions to medical literature In the World War, Dr Brooks served, first as chief of the medical service at the Camp Upton Hospital and later in France as chief medical consultant to the First Army and then as senior medical consultant to the Second Army, A E F

His services to the Academy were numerous and important He was a vice-president of the Academy from 1932-1934 and for ten years he was a member of the Committee on Medical Education, and its Chairman for three years, from 1932-1934

COLEY, WILLIAM BRADLEY, B A, M D, 123 East 53 Street, New York City, received the degree of Bachelor of Arts from Yale University in 1884 and graduated in medicine from Harvard Medical School in 1888, elected a Fellow of the Academy March 3, 1892, died April 16, 1936

Dr Coley was surgeon-in-chief emeritus to the Hospital for Ruptured and Crippled, surgeon-in-chief to the Mary McClellan Hospital, Cambridge, N Y, and consulting surgeon to the Memorial Hospital, the Fifth Avenue Hospital, the Physicians' Hospital (Plattsburg, N Y), and the Sharon Hospital (Conn) He was at one time professor of clinical cancer research at Cornell University Medical School

He was a Fellow of the American Medical Association, American College of Surgeons, American Surgical Association, Southern Surgical and Gynecological Association, International Surgical Society and a member of the New York Surgical Society, Pathological Society, Radiological Society of North America, American Society for the Control of Cancer, American Association for the Advancement of Science, Harvard Medical Society,

Alumni Association of New York Hospital and the County and State Medical Societies. He was an Honorary Fellow of the Royal College of Surgeons of England and an Honorary Member of the Association of Surgeons of Great Britain and Ireland.

Yale University conferred the degree of Master of Arts on Dr. Coley in 1910 in recognition of his work in surgery. Harvard conferred the same degree on him in 1911.

Dr. Coley was the author of several books and a frequent contributor of articles to medical journals on subjects relating to hernia and cancer.

DUEL, ARTHUR BALDWIN, M.D., 135 East 64 Street, New York City, graduated in medicine from Harvard Medical School in 1894, elected a Fellow of the Academy June 1, 1899, died April 11, 1936.

Dr. Duel had been associated with the Manhattan Eye, Ear and Throat Hospital since 1895 and at the time of his death was Vice-President and Chairman of the Board of Surgeons. He was consulting nasal surgeon to the Babies Hospital, Skin and Cancer Hospital, New York Board of Health, and Englewood Hospital, consultant otologist to the Flushing Hospital and Post-Graduate Hospital and consultant otolaryngologist to the North Community Community Hospital, Glen Cove. From 1890-1900 he was connected with the New York Eye and Ear Infirmary and from 1908-1913 he was professor of otology at the New York Polyclinic Medical School.

Dr. Duel was an Honorary Fellow of the Société de Laryngologie des Hôpitaux de Paris, a Fellow of the International Collegium Otolaryngologicum, the American Medical Association, the American College of Surgeons and held a certificate from the American Board of Otolaryngology. He was president at one time of the American Otological Society. He was a member of the permanent committee of the Congrès Internationale d'Oto-Rhino-Laryngologie, the American Laryngological, Rhinological and Otological Society, the New York Otological Society and the New York County and State Societies.

He contributed many articles to textbooks and medical journals on the disease and treatment of the eye, ear, nose and throat.

Dr. Duel was vice-president of the Academy from 1922 to 1924 and served as chairman of the building committee of the Academy from 1923-1933 at the time of the construction of the present building, as a member of the Committee on Library from 1916 to 1921, and as a member of the Board of Trustees from 1924 until his death.

HERRIMAN, FRANK RICHARD, M.D., 30 East 40 Street, New York City, graduated in medicine from the Long Island College Hospital in 1902, elected a Fellow of the Academy April 6, 1921, died April 4, 1936. Dr. Herriman had been at one time assistant professor of otolaryngology at the New York Post-Graduate Medical School and Hospital.

He held the certificate of the American Board of Otolaryngology and was a Fellow of the American Medical Association.

NEMET, GEZA, M.D., 2 East 86th Street, New York City, graduated in medicine from the Royal University of Budapest in 1919, elected a Resident Fellow of the Academy June 7, 1932, died March 1, 1936

Dr Nemet was physician and chief cardiologist to the Montefiore Hospital. He was a Fellow of the American Medical Association and a member of the County and State Medical Societies.

ROSENTHAL, MAX, M.D., 36 West 89th Street, New York City, graduated in medicine from the University of Leipzig in 1887, elected a Fellow of the Academy April 5, 1906, died April 3, 1936. Dr Rosenthal was one of the founders and at the time of his death was president of the board of the Sydenham Hospital. He was consulting gynecologist to the Montefiore Hospital, Beth David Hospital, Bronx Hospital and Lenox Hill Dispensary.

Dr Rosenthal was a Fellow of the American Medical Association and a member of the New York County and State Medical Societies.

SYDENSTRICKER, EDGAR, M.A., 40 East 10th Street, New York City, received his degree of Master of Arts from Washington and Lee University in 1902, elected an Associate Fellow of the Academy February 21, 1930, died March 19, 1936.

Mr Sydenstricker was chief statistician of the United States Public Health Service for many years, and organizer and Chief of Service of Epidemiological Intelligence and Public Health Statistics of the League of Nations at Geneva in 1923-24. He was on the staff of President Roosevelt's Committee on Economic Security and at the time of his death was scientific director of the Milbank Memorial Fund. He had been statistical consultant to the New York State Charities Aid Association since 1926 and the United States Public Health Service since 1928.

Mr Sydenstricker was a lecturer and the author of many books, and contributed frequently to scientific periodicals on subjects of public health, epidemiology, medical economics and social research.

TYSON, HENRY HAWKINS, M.D., 20 East 53 Street, New York City, graduated in medicine from New York University Medical College in 1887, elected a Fellow of the Academy November 6, 1890, died April 18, 1936.

Dr Tyson was surgeon to the Knapp Memorial Hospital and ophthalmologist to the Sea Breeze Hospital and to the Letchworth Village Hospital. He was clinical instructor of eye diseases in the College of Physicians and Surgeons from 1903-1915.

He was at one time Chairman of the Section of Ophthalmology and a former president of the New York Ophthalmological Society. Dr Tyson was a Fellow of the American Medical Association, the American College of Surgeons and a member of the Ophthalmological Society, the American Ophthalmological Association and the County and State Medical Societies.

He was the author of many books and articles on diseases of the eye.

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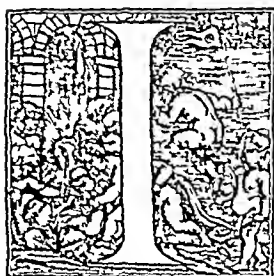
JUNE, 1936

No 6

A READING FROM VESALIUS
AND
THE PHYSIOLOGY OF VESALIUS

A READING FROM ANDREAE VESALII,
DE CORPORIS HUMANI FABRICA LIBER
VII DE VIVORUM SECTIONE NONNULLA
CAPUT XIX*

SAMUEL W LAMBERT



It has always seemed to the writer when inspecting and studying the epoch making folio of Vesalius, *Andreas Vesalius, De corporis humani fabrica, Libri septem*, that everyone limits one's attention to the illustrations, and that no one ever attempts to read or translate the text. This results from difficulties of the modern physician in handling the Latin language, and from the remarkable character of the drawings of the dissections, and their skillful and artistic reproduction by Jan Stephan van Calcar, the artist, by engraving on wood.

The following translation is an attempt to understand just what Vesalius knew of physiology, and to determine if possible why he did not discover the circulation of the blood. The last chapter of the seventh book of the Vesalian Treatise has been selected. The text used is that of the second edition which was published twelve years after the first, also at Basel, and by the same printer, Joannes Oporinus. This second edition was rewritten in part and contains some new material which often consists of the insertion of only a single or a few words. The larger size of the volume is due not so much to the rewriting of the text as to the fact that it was printed in a larger type than that used in the first edition.

* Reproduced with corrections and additions by permission of Columbia University Press. Reprinted from the Proceedings of the Charaka Club, Vol. VIII, February, 1935.

The second edition is a book of 824 pages of 49 lines each, while the first consists of 663 pages of 57 lines each. This final chapter of Book Seven consists of 336 lines divided into 7 pages while in the first edition it is made up of only 5 pages containing 280 lines. It is the final chapter in the last of the seven books of the work of Vesalius, and treats exclusively of vivisection.

I take pleasure at this time in acknowledging the help in the translation of this chapter from Vesalius of William Waid Foshay, studiosus Harvardiensis, and of Frank Hinchley Platt secundus, studiosus Yalensis, fellow anglers with me in the headwaters of the Androscooggin, and in its final revision, of Miss Gertrude Annan, Miss Helen Field and Miss Eleanor Sheldon, of the Librarian's staff at the New York Academy of Medicine.

In deciding on a format for the version of this chapter in English, the periods beginning with capital letters have been treated as paragraphs, and the marginal headings of the original are introduced as subtitles for presentation of the separate subjects.

NOTE —The republication of this paper so soon after its appearance in the Proceedings of the Charaka Club seems advisable to the author, in order that a basic error may be corrected. It is believed that sufficient credit was not given to Caelius in the original publication. This was due to the impossibility to consult in New York City the original book of Caelius of 1583, "De Plantis." A corrected statement of the claims of Andreas Caelius as a discoverer, as now understood by the author, is presented in this version.

ANDREAE VESALII DE CORPORIS HUMANI
FABRICA LIBER VII DE VIVORUM SECTIONE
NONNULLA—CAPUT XIX

*Quid mortuorum
sectione & quid
vivorum discatur*



ERINDE sane ac mortuorum sectio cujusque partis numerum, situm, figuram, substantiae proprietatem & compositionem accuratissime

docet ita quoque vivi animantis sectio interim functionem ipsam manifesto ostendit, interim ad hujus inventionem ratioconationes percommode exhibet quare etiam merito in mortuis animantibus primum studiosi veniunt exercitandi, ut postmodum, actionem usumque partium inquisituri, prompte vivum animal aggrediantur Caeterum quum corporis permultae sint particulae, differentibus actionibus usibusque dicatae multiplices quoque vivorum sectiones esse, neminem decet ambigere In ossibus quippe, ut seriatim singula pertractemus, a vivorum Anatomie petimus, num corporis haec optimum fulcrum ac firmamentum sint, numque omnia his adnascantur, adstabilianturque quum enim vivi animantis os aliquod ruptum cernuus, universum membrum fracturae sub

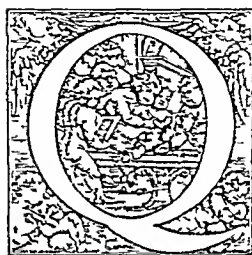
*Ossium ac
Cartilaginum
usus in vivo
animanti qui
videndus*

THE SEVENTH BOOK CONCERNING THE STRUCTURE OF THE HUMAN BODY

ANDREAS VESALIUS

CHAPTER XIX CONCERNING SOME DISSECTION OF THE LIVING

WHAT MAY BE LEARNED BY DISSECTION OF THE DEAD
AND WHAT OF THE LIVING



QUITE as the dissection of the dead teaches well the number, position and shape of each part, and most accurately the nature and composition of its material substance, thus also the dissection of a living animal clearly demonstrates at one time the function itself, at another time it shows very conveniently the reasons for its existence. Whereby also even though students deservedly first come to be skilled in the study of dead animals so that afterward when about to investigate the action and use of the parts (of the body) they quickly approach the living animal.

On the other hand since very many small parts of the body are endowed with different uses and functions, it is fitting that no one doubt that dissections of the living present also many contradictions.

THE USES OF BONES AND CARTILAGES WHICH MAY BE SEEN IN THE LIVING ANIMAL

Precisely concerning the bones, as we handle the individual bones, one after another, we request answers from the dissection of the living whether these are the best foundation and support of the body, and whether all things are attached to them and made firm. To be sure when we observe the bone of a living animal which has been broken by some accident, we perceive that the whole limb sub-

*Ligamentum
usus*

jectum collabi, neque amplius firmari intue-
 mui quod quia crebrius casu obvenit, in
 ossium usu indagando, vivorum sectionem
 non magnopere requirimus Cartilagine
 quoque simili ratione quaedam firmare,
 quum franguntur, discimus in articuli vero
 alicujus dissectione, videmus quid cartilago
 praestet, etiam si hanc in vivo animante non
 obeamus atque ita etiam ligamenti ossa
 colligantis usus in mortuis quoque visitur,
 ut & ligamentorum etiam transversim ten-
 dinibus obductorum dum enim transversum
 in brachialis interna sede positum ligamen-
 tum dividimus, musculumque digitorum
 secundos aut tertios articulos flectentem ad
 suum principium trahimus, id videmus in
 hoc potissimum factum, ut tendines, quo-
 minus e sua sede exungant, contineat quan-
 quam id in cane vivo etiam licebit cernere, si
 obiter cutem a cubito & manu liberaveris, &
 cultello transversum in brachiale ligamen-
 tum, & alia quae in externa ulnae & radii
 sede ad brachiale habentur, diviseris mox
 enim quum canis suo impetu digitos flectet,
 & extendet, tendines e suis sinibus sublevari
 cernes In hac etiam administratione mus-
 culorum actionem specularere, quum illos in
 se, ubi maxime sunt carnei, colligi, crasses-
 cereque, & rursus produci gracilesque fieri
 videbis, prout collecti partem attrahunt, aut
 remissi eductique eam ab alio musculo in
 contrarium velli sinunt, aut etiam alioquum
 suam collectionem non exercent Neque, id

*Musculorum
usus & functio
qui spectentur*

jected to fracture collapses on itself and no longer gives support, and because such injuries happen more frequently by chance, we do not when examining the use of bones inquire particularly through the dissection of the living

We learn also when certain cartilages are broken that they furnish strength in a similar manner. In truth we see in the dissection of any joint which cartilage may be displaced even if we do not observe this while the animal lives

THE USE OF LIGAMENTS

And likewise in the dead also one sees the uses of the ligament binding the bones together, and also that of the ligaments drawn across tendons. Thus, provided we divide the ligament placed transversely in the internal side of the foreleg and pull on the muscle flexing the second or third joints of the digits towards its origin, we discover that this tendon is so placed chiefly in order that it may hold the tendons together that they may not lift up from their bed. However it will be permitted to demonstrate this likewise in a living dog if thou shalt immediately free the skin from the elbow and paw, and shalt divide with a small knife the transverse ligament of the fore leg and the other parts which are held against the leg on the external side of the ulna and radius. Soon, forsooth, when the dog of its own volition flexes and extends its toes thou shalt see the tendons rise up from their sheaths

THE USE AND FUNCTION OF THE MUSCLES WHICH MAY BE SEEN

For in this demonstration thou shalt see the function of the muscles that of their own action they contract and become thick where they are most fleshy, and again that they lengthen and become thin according as they in combination draw up a limb, either letting themselves go back and having been drawn out permit the limb to be pulled in an opposite direction by another muscle, or at other times indeed they do not put in action their own combination

*Nervi in
musculis usus*

hic in cubito duntaxat est observandum, verum altius ab eodem cane cutis est adimenda, ut brachium universum axillaque denudetur, & nervi per axillam in id prorepentes appareant ex illisque aliquem laqueo intercipias, cuius seriem in musculos quosdam pertinere cognoveris Verum quum canis nervorum numerus distributioque non admodum cum homine conveniat, suaserim, ut quum hanc sectionem in vivo cane obitus es, mortuum quoque ad manum habeas, in quo nervorum per brachium & cubitum excurrentium seriem didiceris, atque ita nervum aliquem inveneris, qui in musculos quosdam digeritur uti fere illi erunt, quorum alter in homine tertius est, ac secundum anteriorem cubiti articuli sedem in cubitum fertur alter vero quintus, secundum posteriorem interioris humeri tuberis regionem in cubitum propeians Hujusmodi enim nervi in cane etiam observantur, & illis alicubi priusquam ad cubiti articulum pertingant ligatis, motus aboletur musculorum digitos & brachiale flectentium unde si & illum nervum etiam vinculo intercepteris, qui in homine mihi quartus numeratur, & secundum humerum ad externum ipsius tuber porrigitur, etiam motus abolebitur musculorum brachiale & digitos extendentium Conduxerit autem hujusmodi nervos laqueis intercipere, quo illis modo in hoc, modo in illo nervo solutis, musculorum motum restitui observes Jam musculo alicui muris forma donato (quales hic in cubito occurrunt plurimi) longam sectionem induces, quae ventrem totum penetret, ut musculi illius motum, hujus sectionis gratia non perdi expendas Dum aut transversam

This is to be observed accurately at the elbow, indeed the skin of the same dog must be removed higher up in order that the whole leg [brachium] and axilla shall be bared, and the nerves running forward into it [the leg] through the axilla may become visible. Thou shalt perceive that a chain of these nerves reaches to certain muscles and thou shalt intercept some one among them with a noose.

THE USE OF THE NERVE IN THE MUSCLES

In truth since the number and distribution of the nerves of the dog do not correspond exactly with those same in man I would advise when thou art about to perform this dissection in a living dog that thou hast at hand a dead one also in which thou shalt have separated the series of nerves running out through the foreleg and elbow, and thus thou wilt find some one of these nerves which is distributed to particular muscles. They will be arranged almost in this manner. In man one of them is the third, and is carried into the forearm along the anterior side of the elbow joint, another, in fact, the fifth, runs to the elbow next to the posterior portion of the internal tuberosity of the humerus. For in this manner the nerves are observed also in the dog. And these nerves having been tied somewhere before they reach the elbow joint, the motion of the muscles flexing the digits and arm will be abolished, and if thou wilt intercept with a band the nerve which in man is reckoned by me the fourth and is extended along the humerus to its external tuberosity, then the motion of the muscles extending the fore leg and digits will be abolished.

But on the contrary it will be useful to free the nerves in this observation from the ligatures in order that when these are untied thou shalt observe sometimes in this and some times in another nerve that the motion of the muscles is restored.

Immediately when any muscle has been given the form of a mouse (many such occur here at the elbow) thou shalt perform a longitudinal cut which shall penetrate its whole belly in order that thou mayest determine that the motion of that muscle is not lost on account of this incision.

sectionem ventri induces, tantum musculi motum aboleri videbis, quanta erit sectionis profunditas. Quum vero ventrem prorsus divides, musculum ad insertionem ipsius una parte, alia vero ad exortum colligi retrahique observabis. Quod si alterius alicujus musculi tendinem praeseindes, musculum versus exortum convelli cernes. Item si caput divideris, is ad insertionem contractus. Si vero insertionem & caput una abtruncaveris, musculus ad suum ventrem sedemque qua maxime carneus est conglobabitur itaque musculorum functio tibi haec molienti erit obvia. Si aut privatim nervi alicujus, aut peculiaris musculi functionem inquirendam duxeris, eum nervum & musculum, ut jam in brachio & cubito faciendum praecepi, aggredieris. Neque est quod hic prolixè commemorem, qualiter in his administrationibus canes aut eius generis animalia ligare conveniat, quum quisque pro sua industria, si modo in mortuorum sectione adamussim versatus fuerit, haec omnia rectissime sit obiturus. Adeo ut de viva nervorum musculorumque sectione, nihil dicendum supersit, quanquam & de nervis recurrentibus paulo post quaedam nova sese offerente occasione subjiciam. Ut aut videas nunquam nervi substantia, aut membranae illam induentes, animalem vim praecipue porrigant, opportune feceris, si cutem femoris tibiae & pedis anteriores, ac primo femur moventium musculo a suis exortibus liberato,

On the other hand while thou performest a transverse section of its belly thou wilt see that the motion of the muscle is lost in proportion to the depth of the cut

When in truth thou dividest the belly straight through thou wilt observe that the muscle draws together and contracts in one part towards its insertion, in the other portion towards its origin

But if on the other hand thou shalt cut the tendon of any muscle thou shalt see that the muscle contracts towards its origin Likewise if thou shalt divide the origin it will contract towards its insertion If in truth thou shalt have cut the insertion and the head at the same time the muscle will be bunched at its belly and the portion where it is most fleshy, and thus the function of the muscles will be obvious to thee by the doing of these things

If thou shalt desire to inquire especially into the function of any particular nerve or of a special muscle, thou wilt reach that nerve and muscle as I have already advised that it be done at the fore leg and elbow

And I need not make mention in many words what this is, in what manner it will be fit in these experiments to tie up dogs or animals of this nature, since anyone shall accomplish all these things most correctly according to his diligence if he shall be skilled accurately in the dissection of the dead

EXAMINATION OF THE USES OF THE NERVES

As long as nothing remains to be said concerning the vivisection of the nerves and muscles, I shall submit a little later when some new opportunity offers something also concerning the recurrent nerves

In order that thou mayest see whether the substance of the nerve or the membranes covering it especially conduct the "animal spirits," thou shalt do this conveniently if thou shalt lift the skin of the thigh, the shin and the foot, and having first freed the muscle moving the thigh from its

quantum femur petentem nervum inquiras
& hujus membranis a nervi substantia de-
tractis, expendas quibus pedis digiti ipseque
pes adhuc moveantur, ipseque nervus con-
creditum sibi munus adhuc utcunque exer-
ceat Verum si quis medullae dorsalis munus

*Dorsalis medullae
examen*

rimari statuisset, visurus quibus ea laesa,
partes laesioni subditae sensum motumque
perdant, huic licebit canem ita asserti cupiam
aut trunco alligare, ut dorsum cervicemque
porrigat, quo deinde grandiori cultio vertebra-
rum aliquot spinae praescindi queant, tan-
demque dorsalis medulla ea sede nudari
possit, qua illam quis secandam arbitrabitur
nihil enim facilius est, quam tunc videre
motum sensumque subditarum sectioni par-
tium aboleri Caeterum in venarum usu in-

*Venarum et
Arteriarum usus
Examen*

quiendo, vix quoque vivorum sectione opus
est quum in mortuis affatim discamus, eas
sanguinem per universum corpus deferre, &
partem aliquam non nutiri, in qua insignis
vena in vulnere praescinditur Item in
arteriis, vivorum sectionem vix requirimus,
quanquam licebit alicui arteriam in inguina
procedentem nudare, vinculoque intercipere,
ac intueri, partem arteriae vinculo sub-
tensam non amplius pulsare Atque ita levi
negotio observatur in arteriis sanguinem
natura contineri, si quando arteriam in vivis

origins thou shalt search for the fourth nerve entering the thigh, and having removed the membranes from the substance of this nerve thou shalt seek out those by which the digits of the foot and the foot itself have up to this time been moved, and also the nerve itself that has up to this time performed whatever function belonged to it

EXAMINATION OF THE USES OF THE DORSAL MEDULLA

Even so if anyone may have considered examining the function of the dorsal medulla, it will be seen when the medulla has been injured how the parts below the injury lose sensation and motion. It will be permitted anyone to fasten a dog or to bind it to a block of wood in a way that one stretches out the back and neck. Therefore some of the spines of the vertebrae can be cut in front with a large knife and then the dorsal medulla can be laid bare in its bed, when anyone will get a view of the medulla about to be cut—for nothing is easier than thus to see that movement and sensation are abolished in the parts subjected to the section.

EXAMINATION OF THE USES OF THE VEINS AND ARTERIES

Also when inquiring into the use of the veins the work is scarcely one for the dissection of the living, since we shall become sufficiently acquainted in the case of the dead with the fact that these veins carry the blood through the whole body and that any part is not nourished in which a prominent vein has been severed in wounds.

Likewise concerning the arteries we scarcely require a dissection of the living although it will be allowable for any one to lay bare the artery running into the groin and to obstruct it with a band, and to observe that the part of the artery cut off by the band pulsates no longer.

And thus it is observed by the easy experiment of opening an artery at any time in living animals that blood is naturally contained in the arteries.

aperimus Ut autem certiores fiamus, pul-
 sandi vim non arteriae inesse, aut contentam
 in arteriae materiam pulsum opificem ex-
 istere, verum a corde eam virtutem pendere,
 praeterquam quod arteriam vinculo inter-
 ceptam non amplius sub vinculo pulsare
 cernimus, licebit inguinis femorisve arteriae
 longam sectionem inducere, & canaliculum
 ex arundine tam crassum assumere, quanta
 arteriae est capacitas & ita illum sectioni
 indere, ut superior canalis pars altius in
 arteriae cavitatem peringat, quam sectionis
 superior sedes & ita inferior quoque canalis
 pars, deorsum magis ipsa inferiori sectionis
 parte protrudatur ac dein vinculum arteriae
 circumdetur, quod ipsius corpus super
 canalem stringat Quum enim id fit, sanguis
 quidem & spiritus per arteriam ad pedem
 usque excurrit, verum tota arteriae pars
 canali subdita non amplius pulsat Soluta
 autem vinculo arteriae pars canali suc-
 cedens, non minus quam superior pulsum
 ostendit Quanta vero vis a corde per
 arterias cerebrodeducatur, postea videbimus
 nunc Galeni vivam in hac demonstratione
 consectionem summo opere mirantes, qua
 omnia praescindi suadet quae cerebri & cordi
 sunt communia semper omittens arterias,
 quae per transversos vertebrarum cervicis
 processus caput petunt, & etiam non
 mediocrem portionem vitalis spiritus in
 primos durae membranae sinus, atque ita
 etiam in cerebrum deferunt adeo ut non
 mirum sit, cerebrum diutius in illa admin-
 istratione suo munere fungi, quam com-
 mode Galenus fieri arbitrabatur, respirat
 enim in hac sectione diutissime animal, &
 alias movetur si vero currit, itaque multo
 spiritu indiget, non multo post concidit
 quanquam adhuc postea cerebrum animalis

In order that on the other hand we may be more certain that the force of pulsation does not belong to the artery or that the material contained in the arteries is not the producer of the pulsation, for in truth this force depends for its strength upon the heart. Besides, because we see that an artery bound by a cord no longer beats under the cord, it will be permitted to undertake an extensive dissection of the artery of the groin or of the thigh, and to take a small tube made of a reed of such a thickness as is the capacity of the artery and to insert it by cutting in such a way that the upper part of the tube reaches higher into the cavity of the artery than the upper part of the dissection, and in the same manner also that the lower portion of the tube is introduced downward farther than the lower part of the dissection, and thus the ligature of the artery which constricts its caliber causes the cannula to encircle the closed artery.

To be sure when this is done the blood and likewise the vital spirit run through the artery even as far as the foot in fact the whole portion of the artery replaced by the cannula beats no longer. Moreover when the ligature has been cut, that part of the artery which is beyond the cannula shows no less pulsation than the portion above.

We shall see next how much force is actually carried to the brain from the heart by the arteries. Now in this demonstration thou shalt wonder greatly at a vivisection of Galen in which he advises that all things be cut off which are common to the brain and heart, always excepting the arteries which seek the head through the transverse processes of the cervical vertebrae and carry besides a substantial portion of the vital spirit into the primary sinuses of the dura mater and also in like manner into the brain. So much so that it is not surprising that the brain performs its functions under these conditions for a long time, which Galen observed could easily be done, for the animal breathes for a long time during this dissection, and sometimes moves about. If indeed it runs, and therefore requires much breath, it falls not long afterwards although the brain will still afterwards receive the essence of the

*Eorum quae
peritoneo
continentur
functionum
examen*

spiritus substantiam recipiat, ab illis arteriis quas per transversos cervicis vertebrarum processus calvariam petere recensui. Caeterum hoc loco, ubi de vivorum sectione obiter tantum pertractandum duxi, haud proposui Galeni aut recte, aut minus recte celebratas vivorum sectiones commemorare quum hic abunde fecero, si perfunctorie aliquot sectiones proferam singulis libris dicatas. Atque quum jam ad quintum usque sit deventum, modo de nutritionis organo sermonem instituemus, quorum munus fere in mortuorum sectione etiam discimus. Videmus enim peritoneum omnium ipso complexorum organorum esse involucrum omentum, ut & mesenterium, vasorum deductioni & distributioni optime subservire ventriculum cibos & potum conficere, hosque per stomachum huc deferri. Quanquam & vivis canes, qui modo paulo aut multo ante cibum sumpserunt, vivos aggredi, atque ita etiam intestinorum munus rimari, nihil prohibeat. Jecoris autem officium, ut etiam lenis, aut renum, aut vesicae, in vivorum sectione vix melius quam in mortuorum intneri possumus nisi quis vivo cani lenem execare voluerit, uti & ego aliquando feci, diebusque aliquot canem asservavi. Atque ita etiam renem aliquando execu. verum vulneris curatio molestior est, quam quae hinc sumitur cognitio jucunda nisi quis non

animal spirit from those arteries which I have closely observed seek the skull through the transverse processes of the cervical vertebrae

Besides in this place where I have considered that so much concerning vivisection ought to be investigated in passing, I have by no means proposed to comment on the celebrated dissections of Galen on the living either favorably or unfavorably since I shall do this sufficiently if I shall present in a formal manner some dissections appropriate to the [my] separate books

EXAMINATION OF THE FUNCTIONS OF THOSE PARTS WHICH ARE CONTAINED IN THE PERITONEUM

And since the fifth book has been reached, we will begin a discourse concerning the organs of nutrition, with the functions of which also we commonly become acquainted in the dissection of the dead

For we see that the peritoneum is a wrapper for all the organs enclosed in it, that the omentum and likewise the mesentery serve in the best manner for the conduction and distribution of the blood vessels, that the stomach prepares the food and drink, and passes these through the stomach onward

And however nothing may prevent our taking living dogs which have consumed food at less or greater interval previously and examining them alive, and thus investigating the functions of the intestines. But on the contrary we are able to behold the functioning of the liver as also of the spleen or of the kidneys or of the bladder during the dissection of the living, scarcely better than in that of the dead, unless someone shall wish to excise the spleen in the living dog which I have once done, and have preserved the dog [alive] for some days

And thus also have I once excised a kidney, in truth, the management of this wound is more troublesome than the pleasant knowledge which is acquired in the doing of it,

*Generations
organum
examen*

*Foetuum
examen*

tam organorum cognitionis ratione has sectiones aggredieretur, quam ut manum exerceat, ac abdominis vulnera apte sive discat quod & in intestinis studiose experiendum est, quo quis vulnerata consuevit, atque in abdomen quum exciderint, imponere assuescat Verum haec, perinde ac ossium luxationes & fracturae, quas in brutis aliquando molimur, exercendis potius manibus, & rectae curationi instituendae, quam organorum officii indagandis conducunt Porro vivas sectiones instrumentorum generationi subservientium, indies fere in ianicum curationibus, & in animalibus quae castrantur observamus atque illae propemodum vasis seminarii & testibus spectandis sufficiunt nisi quis illam quoque addere velit, quam canini testis substantiam ex tunica ipsi proxime obducta eximus, aut etiam a seminarii vasis testis substantiam una cum illa tunica rescindimus Verum in foetuum viva administratione jucundum est spectare, qualiter simulatque foetus aerem ambientem contingit, respirare nititur Atque haec sectio opportune in cane aut sive obitur, quum non multo post sus est paritura Si enim ipsius abdomen ad peritonaei usque cavitatem divideris, atque dein uterum quoque in unius foetus sede aperveris, ac secundina ab utero liberata foetum mensae imposueris, cernes per pellucas membraneasque ipsius tunicas, qualiter is frustra respirare conatur, & veluti suffocatus moritur si vero foetus in volucra pertuderis, ipsiusque caput illis

unless one undertakes these dissections not so much for the sake of knowledge of the organs as in order to train his hands, and to learn to sew up wounds of the abdomen in a fitting manner, which should also be diligently practiced upon the intestines, in order to become accustomed to sew them up when wounded, and to replace them in the abdomen when they shall have slipped out

In truth these operations, just as the dislocations and fractures of bones, which we sometimes do on brute beasts, serve more for training the hands and for determining correct treatment rather than for investigating the functions of organs

EXAMINATION OF THE ORGANS OF GENERATION

Furthermore, we commonly observe vivisections of the organs serving for generation from day to day in the treatment of hernia and in animals which are being castrated. These operations are almost entirely sufficient for observing the vasa seminalia and testes, unless anyone wishes also to add that dissection in which we remove in a dog the substance of the testicle from the tunic closely covering it, or even in which we resect the whole testicle together with the tunic itself from the seminal vessels

EXAMINATION OF THE FETUS

Quite pleasing is it in the management of the fetus to see how when the fetus touches the surrounding air it tries to breathe. And this dissection is performed opportunely in a dog or pig when the sow will soon be ready to drop her young

To be sure if thou dividest the abdomen of such an animal down to the cavity of the peritoneum, and then thou also openest the uterus at the site of a single fetus, and when the secundines have been separated from the uterus thou shalt place the fetus on a table, thou shalt see through its coverings and its transparent membrane how the fetus attempts in vain to breathe, and dies just as if suffocated. If in fact thou shalt perforate the covering of the fetus and shalt

liberaveris, mox illum veluti reviviscere, & eleganter respirare cernes. Atque quum id in uno foetu indagaveris, alium aggredieris quem ab utero non liberabis, verum apertum ex dicta jam foetus administratione, uterum tantisper invertes, & prius factae sectionis labra extroisum reflectes, dum alterius proximique foetus insima involucrium pars sedesve appareat, & hanc ad eam usque regionem ab utero detegas, qua is exterior foetus involucrio connascitur & qua ampla ea lienis substantiae similis caro habetur, quae vasa ex utero in exterius foetus involucrium pertinentia intertexit. Est enim hac administratione vasorum ille nexus integer asservandus, & reliquum exterioris involucri ab utero detegendum, ut per pellucida foetus involucria arterias per ipsa distributas & umbilicum subeuntes, ad uteri arteriarum rhythmum pulsare, & foetum respirationem nudum conari molique cernas ac dem el fractis peritusisque involucriis foetum tunc respirare, & involucrium umbilicique arteriarum pulsum perne spectes, uteri arterias adhuc cum reliquis extra ipsum arterias pulsantibus. In cordis & pulmonis functionibus pleraque expendimus, motum videlicet pulmonis, & num aspera arteria eorum quae bibuntur portionem assumat dem cordis dilatationem & constrictionem, ac num idem rhythmus sit pulsus cordis & arteriarum, item qualiter venalis arteria distendatur ac comprimatur, & quibus execto corde animal adhuc vivat. In quibus obser-

*Cordis ipsique
subminutatum
partium usus
examen*

free its head from the coverings, thou shalt soon see that the fetus as it were comes to life again and breathes finely

And when thou shalt have investigated this in one fetus thou shalt turn to another which thou shalt not free from the uterus but thou shalt invert the uterus opened by the same management as that of the fetuses just described, and shalt turn the edges of the dissection already made backward until the lower part or site of the coverings of another and nearest fetus shall appear, and thou shalt free this site from the uterus even up to that place where the uterus is fused in the exterior covering of the fetus, and where its abundant flesh will possess a substance similar to the spleen, which interweaves vessels stretching out from the uterus into the external coverings of the fetus

For that network of vessels must be preserved intact during this manipulation, and the remaining external covering must be removed from the uterus in order that thou shalt see through the transparent covering of the fetus that the arteries distributed by the covering and running to the umbilicus pulsate in the rhythm of the arteries running to the uterus, and that the naked fetus attempts and struggles for respiration and thereupon when the coverings are punctured and broken thou shalt see that then the fetus breathes and that pulsations of the arteries of the fetal membranes and of the umbilicus stop Up to this moment the arteries of the uterus are beating in unison with the rest of the arteries outside of itself

EXAMINATION OF THE FUNCTION OF THE HEART AND OF THE PARTS MINISTERING TO THE HEART ITSELF

And we consider many things concerning the functions of the heart and lung, of course the motion of the lungs, and whether their rough artery [trachea] takes to itself a portion of those things which are inhaled, next, the dilatation and contraction of the heart, and whether the pulsation of the heart and arteries act in the same rhythm, also in what manner the venous artery is dilated and contracted, and whereby an animal continues to live after its heart has been

vandis, magnopere animali indigeremus lato pectoris osse donato, & membranas thoracem intersepientes tam distantes obtinente, ut diviso secundum longitudinem pectoris osse, sectionem inter eas membranas ad cor usque ducere possimus, citra thoracis cavitatum (quibus pulmones continentur) pertusionem Verum quum nullum ejusmodi animal praeter hominem, & non caudatam simiam occurrat, in canibus ac porcis, illis que animalibus quorum nobis datur copia, sectiones ita sunt aggradiendae, ut praedicta omnia intuearis Quod itaque pulmo thoracis motum sequatur, hinc patet, quod sectione in aliquo costarum intervallo ad thoracis usque cavitatem ducta, laesi lateris pulmonis pars concidat, neque amplius cum thorace distendatur, reliqua adhuc pulmonis parte thoracis motum sequente quae etiam mox concidet, si & in altero latere sectionem in thoracis usque cavitatem molieris atque ita animal, etiamsi thoracem aliquandiu moveat, non minus morietur, quam si suffocatum esset Verum in hac administratione observandum venit, ut sectionem quam proxime ad superiorem alicujus costae ducas sedem, ne ad inferiorem forte, sectionem dirigens, vasa hac exporiet per tundas tum enim sanguis illinc proflueret, qui aeris per vulnus immissi & emissi gratia, spumosis redditus, pulmonis loco tibi imponeret Incaute enim secantibus ejusmodi spuma pulmo esse videtur, ipsique pulmonem aliquandiu etiam sua insita vi distendi opinantur Ut vero naturalem pulmonis cum thorace sequelam videas, ex altero latere duarum aut trium mediarum costarum cartilagine dissecabis & sectionibus per illarum costarum intervalla ductis, singulas

excised For making these investigations we particularly require an animal endowed with a wide breastbone and possessing membranes dividing the thorax separated in such a way that when the sternum has been divided lengthwise we may be able to carry the dissection between these membranes even to the heart itself without causing a perforation of the cavities of the thorax in which the lungs are contained

Indeed, when no such animal except man or a tailless ape is to be had, these dissections must be carried out in dogs and pigs and those animals of which an abundance is furnished us, as thou has seen all this mentioned above

Therefore and in like manner the lung follows the movement of the thorax It is evident from this why when a cut is made in an intercostal space penetrating the thoracic wall, that the portion of the lungs on the injured side collapses, and distends with the thorax no longer While until then the other lung, following up to this time the movement of the chest also soon collapses if thou shalt make a cut penetrating even into the cavity of the thorax on the other side And then the animal, even if it moves the chest for some time, will die nevertheless just as if it were suffocated

In fact it ought to be observed in this demonstration that thou shalt make the cut as close as possible to the upper edge of any rib lest thou mayest direct the incision by chance along the lower edge and perforate the vessels stretched along there For the blood will flow forth thence at once, which rendered frothy in consequence of the air inhaled and exhaled through the wound, will appear to thee falsely as the lung, for this froth will appear to be the lung to those who dissect carelessly, and they will think that the lung is distended on such occasions by its own inherent force

In order that thou mayest see the natural relationship of the lung to the thorax, thou shalt cut the cartilages of two or three median ribs from the opposite side, and when the incisions have been carried through the interspaces of

costas extrorsum reflectes, ipsasque franges,
 quo opportunam constituas sedem, per quam
 lateris illae si pulmonem videre queas quum
 enim thoracem interceptas membranae in
 canibus admodum pellucidae sint, perfacile
 est, per eas pulmonis partem thoracis motum
 adhuc sequentem intueri, ac illis etiam
 membranis leviter pertusis considerare,
 qualiter & ea pulmonis pars intercidat
 Priusquam tamen eas pertundas, conduxit
 arteriae venalis propagines in eam pulmonis
 partem, quae jam concidit, manibus appie
 hendere, & aliquosque ab ipsis substantiam
 pulmonis liberare ut discas, num illae
 perinde atque cor moveantur Cordis enim
 motus etiam hic tibi est conspicuus, prae
 cipue si cordis involucrum divideris, & ab illo
 cor in eo latere detexeris, ubi hanc admiss
 tionem moliris Conduxerit vero hanc in
 sinistro latere tentari, ut scilicet dextra
 pulmonis pars adhuc moveatur, & una un
 versum arteriae venalis truncum manu com
 mode apprehendas In hujusmodi quoque
 administratione non inutiliter cordis basim
 amplecteris, unoque vinculo vasa ab ipsa
 prodeuntia simul & ocyns interceptas, ac dem
 sub vinculo cor execabis, solutisque quibus
 animal colligatum est laqueis, currere smes
 Vidimus enim aliquosque etiam ita affectos
 canes, sed praecipue feles, cucurrisse Cae
 terum cordis motus, ut & arteriarum, rectius
 spectabis, si mox atque canem asseri ali
 gaveris, sectionem a jugulo per costarum
 cartilagineas, qua illae ossibus continuantur,
 in utroque latere acuto admodum cultro
 duces, ac mox ab unius sectionis fine trans
 versum ad finem alterius sectionis, tertiam

these ribs thou shalt bend the separate ribs outward and break them where thou shalt decide to be the proper place through which thou seekest to observe the lung of the uninjured side, for since the membranes dividing the thorax in dogs are sufficiently translucent, it is very easy to inspect through them the portion of the lung which is following up to this time the movements of the thorax, and when these membranes have been perforated slightly, to consider in what manner that part of the lung collapses

Before thou perforatest these membranes it will have been useful to grasp with the hands the branches of the venous artery in that part of the lung which now collapses, and in some other portion to free the substance of the lung from those vessels in order that thou mayest learn whether these vessels and the heart are moved in like manner

For the movement of the heart is evident to thee even here especially if thou shalt divide the covering of the heart and shalt uncover the heart from it on that side where thou art carrying on this operation

It will be fitting to try this on the left side as of course the right part of the lung may be lifted up to the point and at one time thou mayest conveniently grasp the main trunk of the venous artery easily in the hand Also thou mayest in an operation of this kind carefully handle the base of the heart, and may cut off swiftly and at one time and with one ligature the vessels from their origins, and then thou mayest cut to excise the heart under the ligature, and when the bands have been loosened with which the animal has been tied, thou mayest allow it to run about

Indeed we have at times seen dogs, but especially cats run about when treated in this manner

Besides thou wilt see the movement of the heart and also of the arteries more accurately if soon thou shalt bind the dog to a plank, and shalt carry the incision on both sides with a very sharp knife from the clavicle through the cartilages of the ribs where they are continuous with the bones, and thou shalt make a third incision even into the

sectionem in peritonaei usque cavitatem molieris, & levato pectoris osse cum ipsi coarctatis cartilaginibus, & septo transverso ab us liberato, pectoris os ad animalis caput sursum reflectes ac mox diviso cordis in volucro, una manu cor apprehendes, & alia arteriam magnam dorso exporrectam continebis. Quanquam & haec omnia melius obibis in ea viva sectione, quam inter alias utpote uberiores in scholis exhibere consuevi atque hanc ideo, simulatque nonnulla de cerebro subjunxero, perscribam prolixius, ut ab aliis leviori negotio quoque aggrediatur. In cerebri igitur ipsiusque partium examine, parum omnino in viva sectione videndum est, quum hic velimus nolumus, vel theologorum nostratum causa, memoriam, rationem & cogitationem brutis animalibus adimere debeamus, utcumque illis cum homine eadem sit constructio atque ita Anatomes studiosus, & in mortuorum sectione versatus, nullaque haerese infectus, probe intelligit, quam male mihi consultum velim, si quod alias longe libentissime facerem, de cerebri viva sectione aliquid instituerem. Quod tamen ad sensum & motum pertinet, videre est, cerebro ablato utrumque sentire. Atque hic eadem indagandis in nervorum administratione, ac vere contemplantibus in vero cerebrum sentiat, in sum ad id incisum stigandum qui quum id

*Cerebri
functionum
examen*

cavity of the peritoneum transversely from the end of one of the above incisions to the end of the other, and when the sternum has been lifted with its cartilages pressed to it, and when the transverse incision has been freed from them, thou shalt turn the sternum upward towards the head of the animal and soon when the covering of the heart has been opened thou shalt grasp the heart with one hand and with the other thou shalt take hold of the great artery extending into the back

And although thou shalt accomplish all these things better in that vivisection inasmuch as I have been accustomed to demonstrate this among other things more fully in the schools, and therefore I shall write later about this more fully and at the same time I shall have added something concerning the brain in order that it also may be approached by others with less trouble

EXAMINATION OF THE FUNCTION OF THE BRAIN

In the examination of the brain and of its parts therefore entirely too little is to be seen in the dissection of the living whether we desire it so or not, or whether in deference to the opinion of our present day theologians we ought not to deprive brute beasts of memory, of reasoning and of meditation, how much soever their structure may be the same as in man. And thus one who is studious of anatomy and skilled in the dissection of the dead, and uninfluenced by any heresy, understands honestly how badly I may wish advice for myself if and what I may most gladly carry on at some future time, and what I may undertake concerning any vivisection of the brain

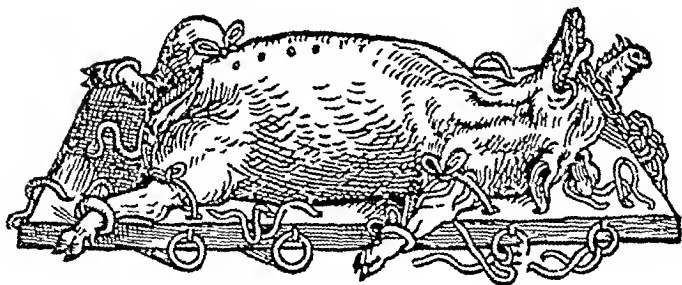
What indeed concerns sensation and motion, it is evident that both cease when the brain has been removed

And the same method [experimental] ought to be pursued in this case, which we advised in operation on the nerves

Whether in truth the brain feels ought to be investigated in man, who may indicate whether he feels pain when

*Viva Sectio qua
Anatomes spec-
ulatione in Scholis
colophon adhiberi
Solet*

scinditur, aut prematur, indicet num dolore afficiatur, numve quo cerebrum alteratur, sentiat uti in capitis vulneribus indies experiri integrum est Rursus calvariam canis posse frangi, & cerebri ventriculum aut dextrum aut sinistrum aperiri, ac quibus animal motum perdat, illumque denuo occluso ventriculo recipiat, neminem ambigere arbitror Porro sectionem quam me descripturum paulo ante pollicebar, in praegnante cane, aut sue aggredieris quanquam vocis occasione suam accipere magis conveniat canis enim aliquandiu ligatus, utcumque illum afficias, subinde neque latrat, neque ululat itaque vocis ablationem aut resolutionem interdum expendere nequis Primum igitur animal ut supinum jaceat, anterioremque colli sedem, & liberum corporis truncum porrigat, asseri ita quam poteris validissime pro tua industria rerumque copia, alligabis Non enim arduum est, asserem quempiam sumere, cui foramina insint ligandis cruribus apta aut si nulla adsint foramina, prompte asseri duo baculi subjiciuntur, illisque crura advincuntur Inter caetera



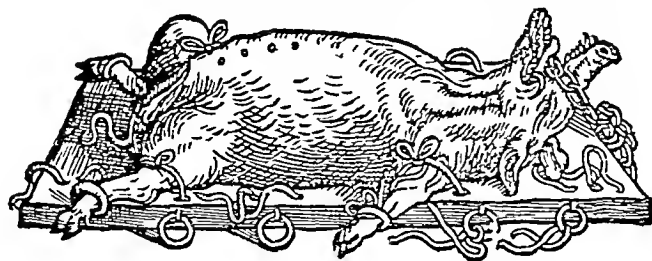
H 1 C figura suam asseri, quem vivis sectionibus administrandis parare solemus, ac ultimo primi libri capite cum reliquis anatomicis instrumentis proposuimus, alligatam conspicis, ut modus quo in nostris scholis utimur, aliqua ex parte foret obvius

the brain is cut or pressed upon, or whether he may perceive by what the brain is affected as is thoroughly put to a test daily in wounds of the head

Again I think that no one doubts that the calvarium of a dog may be broken and the ventricle of the brain, either right or left, be opened from which the animal loses motion and regains it when the ventricle is closed again

A VIVISECTION WHICH IT IS THE CUSTOM TO USE IN THE SCHOOLS AT THE END OF A DEMONSTRATION OF ANATOMY

Furthermore thou shalt begin the dissection of a pregnant dog or pig as I promised to describe a short space above. It is more convenient to select a pig because of the favorable action of its voice for however much thou mayest suddenly injure a dog which has been bound for some time he neither barks nor howls, and thus thou art unable in the meantime to observe the loss or restoration of the voice. At first therefore thou shalt tie the animal to a plank in such manner that it may lie on its back and may stretch the anterior surface of the neck and the free trunk of its body as thou wilt be able most effectively to accomplish many things through thy work. For it is not difficult to take any plank in which there may be holes suitable for tying the legs or if there are no holes, two cleats may be quickly placed under the plank, and the legs be bound to these



In this figure thou seest a pig bound to a plank as we are accustomed to prepare one for performing a vivisection, and we have displayed in the last chapter of the first book the remaining anatomical instruments in order that the method which we use in our lectures shall partly be made evident

autem, superioris maxillae praecipua habenda est ratio, ut illa valde asserti firmetur quod feceris catenula, aut corda quapiam robustiore ante dentes caninos ligata, ac de cuiuspiam assersis anulo, aut foramini, aut ut commodius duxeris commissa, ut scilicet collum exporrectum, caputque immotum sit, & interim animal libere respiret clametque Priusquam vero animal ita vincitur, spectatoribus jam in mortuorum Anatome versatis recensere soleo, quae nam potissimum praesenti sectione sint videnda, ne prolixa inter secundum deum enarratio operi obsit, idque forsitan dicendo inteturbatur Mox itaque longam in collo sectionem acutiori novacula duco, quae cutem & subjectos illi musculos ad asperam usque arteriam dividat id cavens, ne sectio in latius abierit, venamque notatu dignam vulneret deum manibus arteriam asperam comprehendo, & illam ab incumbens musculis digitorum duntaxat opera detegens, ad hujus latera soporales arterias, illique attensos sexti paris nervorum cerebri nervos perquiro deum recurrentes nervos lateribus asperae arteriae adnatos etiam observo, quos interdum laqueis intercipio, interdum praescindo idque primum ex altero latere, ut nervo hic intercepto praesectove dilucide observetur, quibus media vox pereat, totaque ambobus nervis laesis intercidas & si laqueos solvo, rursus redeat id enim cito & citra insigne sanguinis fluxum expenditur, ac pulchre auditur, quam validam efflationem animal citra vocem molatur, recurrentibus nervis cul

*Nervorum
recurrentium
examen vocisque
eorum sectione
abolitio*

Among other things also an especial method should be used for the upper jaw in order that this shall be made fast firmly to the plank. Thou shalt do this with a small chain or any strong cord tied in front of the canine teeth, and to any ring or hole of the plank or fastened as thou shalt have arranged more suitably in order of course that the neck may be stretched and the head motionless, and at the same time the animal breathe and cry out freely.

In fact, before the animal is bound in this manner, I am accustomed to ascertain that the spectators are skilled already in the dissection of the dead, above all in those things which are chiefly to be seen in the present dissection, lest prolonged interpretation during the dissection may hinder the work and this by chance be interrupted by talking.

EXAMINATION OF THE RECURRENT NERVES AND THE LOSS OF VOICE FROM THE CUTTING OF THEM

And soon I begin in this wise an extended dissection in the neck with a rather sharp knife which divides the skin and muscles lying under it right to the trachea, avoiding this lest the incision may deviate to the side and wound especially the principal vein. Then by grasping the wind pipe with the hands, and freeing it accurately from the overlying muscles by the use of the fingers as far as the arteries lying at its side, I seek out the nerves bordering upon the sixth pair of cerebral nerves, then I note the recurrent nerves lying on the sides of the rough artery [trachea] which I sometimes intercept with ligatures, at other times I cut. And first I do the same on the other side, in order that it may be clearly seen when one nerve has been tied or cut how half the voice disappears and is totally lost when both nerves are cut. And if I loosen the ligatures that the voice will return again. For this is carried out quickly and without an unusual loss of blood, and it is clearly proved how the animal struggles for deep breaths without its voice when the recurrent nerves have been divided with a sharp knife.

tello divisis Hinc ad abdomen venio, & acuta validaque novacula sub spuria un costarum cartilaginibus, mucronataque pectoris ossis sede sectionem instar semicirculi uno ductu ad peritoneae usque cavitatem molior ex cujus sectionis medio ad pubem usque aliam tento, quae prompte succedit, si cultrum aut novaculam peritoneae cavitati indem itaque intestina & uterum foetibus distentum duabus illis sectionibus detegem, id sedulo studens, ut astantium quidam pollicem vasis obdat, quae sub pectoris osse descendente abdomen petunt illa enim sola hactenus multum sanguis fundunt Hic modo sectioni viciniores horrei, ut manu septo transverso adhibita, ipsius motum experiantur dissitos aut, ut ventriculi & jecoris veluti in thoracis cavitatem assumptionem & dms sionem spectent Interea in altero thoracis latere longam sectionem ad costarum usque ossa duco, ad eam fere regionem, qua costae in cartilaginem degenerant & dein secundum costarum ossa transversas sectiones molior, ut ossa incumbentibus musculis aliqua ex parte liberem & insuper si operosorem administrationem sequi visum sit, intercostales musculos in duobus costarum intervallis a tunica costas succingente auferam, ut dein mediam inter illa intervalla costam solarum manuum auxilio a tunica costas succingente avellam illaque a sua cartilagine fracta, & deorsum in latus inflexa, magna tunicae costas succingentis appareat amplitudo, quae pellucida pulmonis motum nuncunque commonstret Haec postmodum pertusa, videtur quibus hujus lateris pulmo concidat, thorace interim

*Septi transversa
functionis
examen*

From this point I arrive at the abdomen, and I make an incision to the cavity of the peritoneum in the form of a semicircle with one stroke of a sharp and strong knife below the cartilages of the false ribs and the pointed end of the sternum. From the center of this incision I try another to the pubes, which quickly follows if I shall introduce the knife or razor into the cavity of the peritoneum, and thus I shall uncover by these two incisions the intestines and the uterus distended with young. Studying this carefully in order that some one of those standing by may place a thumb on the vessels which descending under the breast bone seek the abdomen, for only these carry much blood to this region.

EXAMINATION OF THE FUNCTIONS OF THE DIAPHRAGM

In this wise I advise those standing near the dissection that they watch the movement of the diaphragm when it is held in the hand, and those at a distance that they observe the expansion and contraction of the stomach and liver similar to the movements in the cavity of the thorax.

Meanwhile I carry on an extensive dissection on the other side of the thorax to reach the bones of the ribs even nearly to that point where the ribs change into cartilages. And then I make transverse incisions along the bones of the ribs in order that I may free the bones in some part from the overlying muscles, and if it is seen that further painstaking work may follow I lift the intercostal muscles of two intercostal spaces from the tunic covering the ribs that I may thus tear away the intervening rib from the covering surrounding the ribs with the help of my hands alone. And when that rib is broken from its cartilage and bent backward on the side, the great size of this tunic surrounding the ribs will be apparent. This transparent covering will demonstrate however the movements of the lung. After this covering has been punctured it will be seen how the lung collapses on this side although the thorax moves meanwhile just as before.

*Pulmonis
motuum
examen*

aeque ut prius moto Ut vero id magis red
datur conspicuum, plura costarum ossa a
suis cartilaginibus libero, quam possum
maxime hoc thoracis latus aperiens, ut
commode per membranas thoracem inter
sepientes, altera pulmonis pars, quae in
thoracis cavitate nondum laesa, pulchre cum
thorace movetur, sese offerat ac deinceps
illis membranis pertusis, haec quoque mox a
perforatione concidere & collabi videatur
Nunc in altero etiam latere acutiori cultro,
nova sectione costarum ossa a cartilaginibus
libero, & a cartilaginibus pectorisque osse
septum transversum reseco, ut cum car
tilaginibus, os illud divulsis thoracem inter
sepientibus membranis, sursum ad collum
reflecti queat, cordisque involucrium in con
spectu sit quod illico cultello aperiendum est,
observandumque, quantum aquae contineat,
& quibus cor agatur Verum cordis motui
non diu animum adhibebis, quin potius
animali jam fere propter concidentem undi
que pulmonem suffocato succurres ut dem
adamussum iursus cor arteriasque, & foetus
in utero contentos, quamdiu visum erit,
examines Hactenus enim sanguinis fluxus
parum incommodi animali intulit, si modo
illa quae sub pectoris osse repunt vasa astans
aliquis obturaverit, ac pectoris os jam sur
sum ad collum reflexum jaciat, itaque ob
vasorum obliquitatem illa nihil amplius
fundant quod & in vasis costis singulis ex

*Aquae in cordis
involucro
repositae &
cordis motuum
examen*

EXAMINATION OF THE MOVEMENTS OF THE LUNG

In fact in order that this may be made more evident I free many bones of the ribs from their cartilages, opening this side of the thorax as much as I am able in order that there may be presented through the membranes dividing the chest, the other part of the lungs which shows itself and being in the hitherto uninjured part of the thorax, moves well with it. And then when these membranes have been punctured this part also is soon seen to collapse from the perforation, and to fall together.

EXAMINATION OF THE WATER CONTAINED IN THE
PERICARDIUM AND OF THE MOVEMENTS
OF THE HEART

Now also on the other side I free by one incision with a very sharp knife the bones of the ribs from their cartilages, and dissect the diaphragm from the cartilages and from the sternum in order that when the membranes dividing the thorax have been torn apart, the sternum with the cartilages may be bent back and upward towards the neck, and the covering of the heart may be in sight. The pericardium ought to be opened at this place with a small knife, and it should be observed how much water it may contain, and how the heart acts.

In truth thou wilt not for some time give a thought to the motion of the heart but thou shalt rather come to the aid of the animal now almost suffocated because of the collapsed lung in order that thou mayest accurately examine the heart and arteries again and the fetuses contained in the uterus for as long as [the animal] is to be observed.

Thus far indeed the loss of blood has brought little inconvenience to the animal if any one standing near shall obstruct those vessels which run under the sternum, and shall turn the sternum already bent upward towards the neck, thus on account of the bending of the vessels these vessels lose blood no longer, and the same will occur in the vessels when the separate ribs have been stretched as

*Num cordis
et arteriarum
par pulsus fit
examen*

porrectis fit, quum costae effractae deorsum evertuntur ipseque, dum sectionem administras, vasa tantisper dum oblique occludere admissus fueris Ut vero vita animali quodammodo restituatur, foramen in asperae arteriae caudice tentandum est, cui canalis ex calamo aut arundine indetur, isque inflabitur, ut pulmo assuget, ipsumque animal quodammodo aerem ducat levi enim inflatu in vivo hoc animali pulmo tantum quanta thoracis erat cavitas intumet, corque vires denno assumit, & motus ipsius differentia pulchre evariat Inflato igitur semel atque iterum pulmone, cordis motum visu tactuque quantum lubet examinas, & arteriae magnae caudicem dorso explicatam, aut in thoracis cavitate, aut ad lumborum vertebrae comprehendis, & spectas pariter nihilque tibi manifestius occurrit, quam cordis & arteriarum pulsum rhythmus quo aliquandiu observato, pulmo rursus inflandus est hocque artificio, quo mihi gratius in Anatome nullum comperi, magna pulsum differentiarum cognitio paranda venit Quum enim pulmo diu flaccidus concidit, undosus, formicans, & vermicularis cordis arteriarumque pulsus motusve spectatur inflato aut pulmone, magnus rursus & velox effectus, mirasque inaequalitates proponit &, ut semel dicam, haec administratio ejusmodi est, qua omnium optime pulsum naturam medicinae candidatis proponere

for example whenever the broken ribs are everted backwards While thou art carrying on the dissection thou shalt have taken pains to close off the vessels as long as they are bent

In truth in order that the life of the animal may be revived in a certain manner, an opening must be made in the main stem of the trachea in which a pipe made of a reed or cane is introduced, and this is inflated so that the lung is expanded and the animal itself may secure air in some way, for the lung in this living animal expands to an extent equal to the cavity of the thorax and the heart takes on its powers again, and the change alters its action for the better

EXAMINATION WHETHER THE PULSATION OF THE HEART AND ARTERIES IS COINCIDENT

Therefore when the lung has been inflated again and again, thou mayest examine the movement of the heart by sight and touch as much as is desired And thou graspest the trunk of the aorta extended in the back or in the cavity of the thorax or along the lumbar vertebrae, and thou shalt see in like manner, and nothing seems more evident to thee than the rhythm of the beating of the heart and arteries

When this has been observed for some time the lung must be inflated again From this observation the important recognition of the differences of the pulses comes to be determined than which nothing in anatomy can be learned which is more pleasing to me

For when the lung being flaccid for a long time collapses, a wavy, creeping and wormlike pulsation or movement of the heart and arteries is to be seen Or when the lung has been inflated, a large and rapid pulsation is again established and discloses extraordinary irregularities And as I shall say just once, this procedure is of that kind by which I am accustomed best to explain to candidates in medicine the nature of all pulsations

Foetuum examen soleo Verum in horum examine foetuum
 gratia nunc non diu haereo, sed in aliqua
 bicorni canis suisve uteri sede, sectionem
 super foetum aliquem duco ad exterius ipsius
 usque involucrum penetrantem quo dem
 cept ab utero divulso, foetum cum suis in
 volucris eximo, & exteriori effiacto in
 volucio, per interius valde pellucidum
 ostendo, quibus foetus respirare conetur,
 quamque pulchre interiori quoque involucio
 fiacto aerem ducat Mox proximum foetum,
 quantum possum detego, uterum nulla ex
 parte ab exteriori involucio divellens, ut hic
 ita foetus vasorum natura examinetur, ut
 prius vivam foetuum dissectionem facien
 dam praecepi Quum haec melior, per inter
 vallaque pulmonem inflari curo, nondum
 cordis & arteriarum motus latet, verum
 longo admodum tempore animalis vitae suc
 curritur, & cordis auricularum motus etiam
 prompte expenditur, perinde ac arteriae
 venalis, & venae arterialis quas si non sat
 sit proxime ad cor tetigisse, in aliqua pul
 monisfibra ipsius substantiam a vasis ungu
 bus discerpo, & quod hic animadvertendum
 est, observari sino, dextrum postea cordis
 aperiens ventriculum, quo constet, quibus
 cor illo etiam patente, nihilominus moveatur

*Arteria
 Venalis &
 venae arterialis
 motuum examen*

EXAMINATION OF FETUSES

In truth now I do not willingly delay for long the examination of these fetuses but I make an incision over a fetus in some part of the bi horned uterus of the dog or pig, which extends down to the external covering of it. When this has been removed from the uterus, I remove the fetus with its covering, and when the external covering has been torn I demonstrate through the very transparent interior membrane how the fetus attempts to breathe, and how it receives air when the inner membrane has also been ruptured.

Soon I uncover the next fetus as much as I can, separating the uterus from the exterior covering in no part in order that the nature of the vessels of the fetus may be examined in such manner as I have advised previously that the vivisection of fetuses ought to be done.

EXAMINATION OF THE MOVEMENTS OF THE VENOUS ARTERY
AND OF THE ARTERIAL VEIN

When I undertake these examinations I take notice even through the [intercostal] interspaces that the lung is inflated, while the movement of the heart and arteries is still visible. In truth the animal has been kept alive in a way for quite a long time, and besides the movement of the auricles of the heart has been quickly investigated just as also that of the venous artery and of the arterial vein. If it [the opening] is not sufficiently near to the heart to have touched these, I tear into some fibers of the lung and [separate] its substance from the vessels with my nails, and I present for observation that which ought to be considered here, opening the right ventricle of the heart posteriorly particularly where it remains motionless, how the heart, even after it has been opened, moves nevertheless

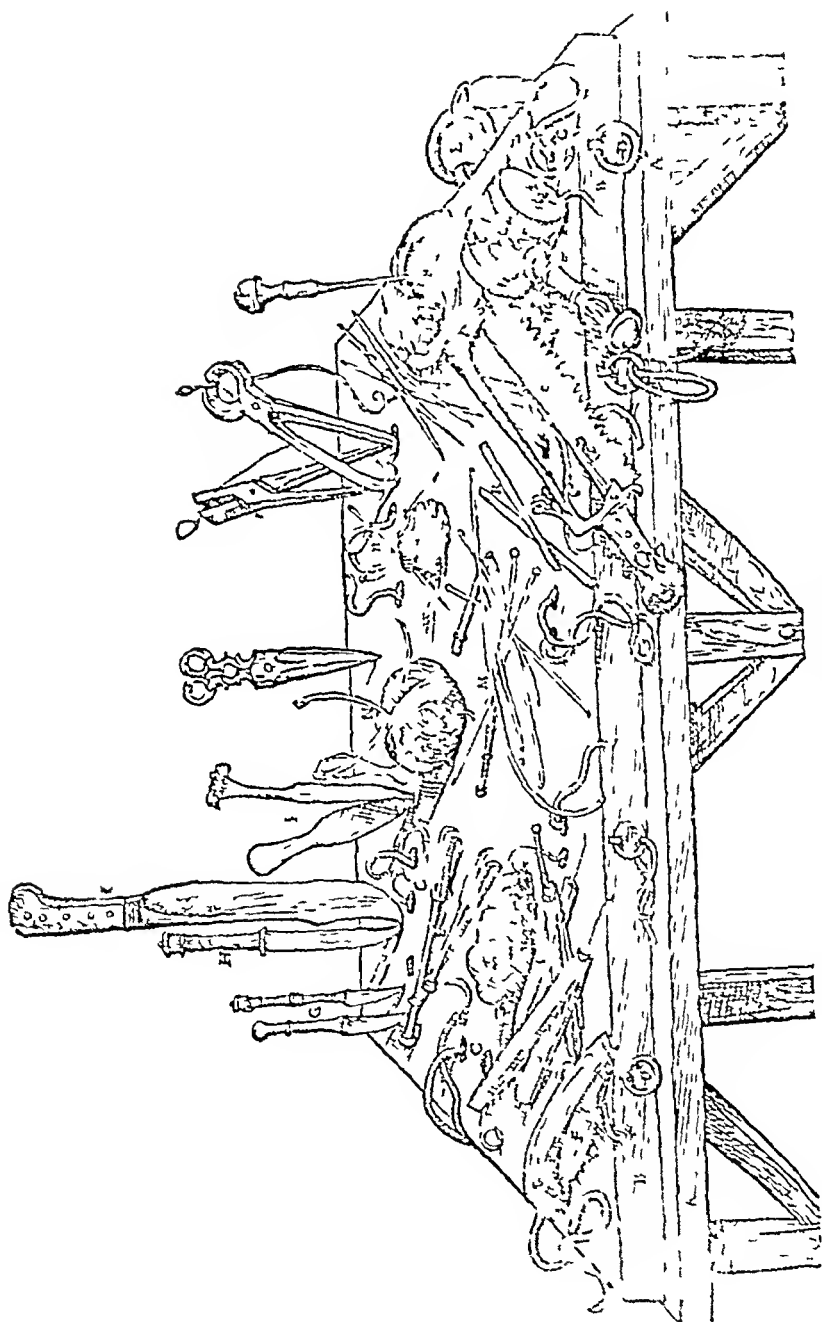
Sinistro insuper ventriculo una adaperto, aut media cordis parte transversa sectione ablata, spectatores moneo, ut auricularum cordis motum nondum quiescere intueantur. Dein si animali ante sectionem potum colore aliquo infectum porreximus, idque cibos varios seriatim ingesserit, cujusmodi humor in pulmonis asperae arteriae ramis occurrat, quaeque ciborum in ventriculo sit series, perquino hac dissectione, toti Anatomicae speculationi colophonem in nostris scholis perinde addens, atque huic meae de Humani corporis fabrica historiae nunc illa finem impono.

SEPTIMI ET ULTIMI LIBRI FINIS

Besides when the left ventricle has been freely opened at the same time, or when the middle portion of the heart has been removed by a transverse cut, I remind the spectators that they observe that the movements of the auricles of the heart do not stop yet. Later if previous to the dissection of the animal we have offered to it a drink dyed with some color or the animal shall have partaken of various kinds of foods, one after another, a liquid of the same color exists in the branches of the rough artery of the lungs [trachea], and I investigate what series of food may be found in the belly.

Quite as adding a colophon to the whole anatomical demonstration in our schools with this dissection, just so with the same I now place an end also to this my treatise concerning the structure of the human body.

END OF THE SEVENTH AND LAST BOOK



The instruments of Vesalius for dissection of the dead and of the living animals, exhibited on an animal planic for vivisection

THE PHYSIOLOGY OF VESALIUS



ESALIUS up to the age of thirty was distinctly an anatomist, and in ending his treatise on the structure of the human body with a chapter "On some dissection of the living," he expresses at once his preference for the study of the dead as a source of knowledge not only of structure but also of function. However, in his description of the use of the ligamentous bands at the wrist and ankle he abandons the dead body, and demonstrates the function of the annular ligaments not only by cutting one on a living dog but also with a simple application of cords on the ankle of a man showing that a cord tied to the big toe, if loose, pulls the ankle but if restrained by a band at the ankle pulls the toe only. Vesalius emphasizes his opinion that skill in vivisection is assured by an accurate experience in the dissection of the dead, and advises the use



of a specimen dissection of the nerves in a dead dog to control and direct the progress of a vivisection of the same region. In general when describing his vivisections Vesalius records his results only, and

draws few conclusions and formulates no theories or explanation of the facts observed. For instance, he calls attention to the loss of motion from ligating the nerve running to a muscle, and also the restoration of movement from cutting the ligature. He does not describe his

results in detail but leaves it to the operator to demonstrate these as they occur in his own vivisection. He describes the effects of loss of motion and of sensation below a transverse section of the spinal cord but does not repeat the more elaborate experiments on the spinal cord attributed to Galen more than thirteen hundred years before. He usually describes the methods of procedure only.

Vesalius errs in his observation that the fetal pulse in the umbilical cord pulsates in rhythm with the pulse of the uterine blood vessels, possibly because he is observing in his experimental animals a general circulation which had been accelerated by the shock of the operative procedure of the precedent vivisection. Vesalius observes correctly that the vessels of the uterus pulsate synchronously with the other arteries of the animal, and that the vessels of the fetal envelopes and of the umbilicus cease to pulsate as soon as the fetus breathes, even if the fetus is still attached by the umbilical cord to the uterine wall.

He records accurately that either lung collapses only after each pleural cavity is punctured, and that the animal dies of suffocation if the pleurae on both sides are punctured at the same time in spite of continued movements of the chest wall, and that the animal will revive for a while if air be blown into the incised trachea at intervals imitating the rhythm of normal respiration. Vesalius proves that an artery ceases to pulsate beyond a ligature, and that pulsation is resumed if a cannula made of reed or cane is made to connect the two parts of the artery above and below the ligature. But he failed to make any similar experiments on the veins. He follows Galen when emphasizing that pulsation is one of the chief characteristics of living tissue and attributes the flow of blood in arteries and veins to the power of suction caused by their pulsation. William Harvey refers in his second letter to Riolanus to this experiment of Vesalius inserting a cannula around a ligated artery as a positive proof of the circulation of blood, and that the pulse is due entirely to the intermittent flow of blood as pumped by the heart and is not transmitted from the heart by the walls of the vessels.

Vesalius gives useful surgical directions to avoid the intercostal blood vessels which are located along the lower borders of the ribs, and describes the difficulties of technique and errors of judgment which may result from haemorrhage from this source. He never suggests controlling haemorrhages from smaller vessels by the use of a ligature, which procedure was rediscovered and introduced into surgical practice by his contemporary, Ambroise Pare, as recorded by Malgaigne in his *Edition of Pare* (1564). Although Vesalius used a ligature to control the vessels entering and leaving the heart when repeating the older experiment of Galen, in which the heart is excised during the life of an animal, he controlled haemorrhages from the intercostal arteries only by bending them. Vesalius pleads for advice concerning any possible plan to permit future work on cerebral function which he might wish to undertake on the brains of living animals. First, he belittles what can be learned by such vivisection, then he complains of the objections raised by the theologians of his day who denied the right of man to take away even from dumb beasts their memory and powers of reasoning and of meditation. This professional criticism by his contemporary antivivisectionists sounds not unfamiliar to the scientists of today, who practise animal experimentation, except that at present the attack on this branch of the scientific study of medicine is more radical and would impose a total prohibition of such work although the animals used in modern laboratories are fully anaesthetized during operative procedures. Vesalius explains that the brain controls motion and sensation, and that when the brain is removed these are lost, and the animal dies at once. He previously had shown that an animal could walk about for an appreciable period of time after the heart had been excised. These two experiments were carried out to repeat the proof of Galen that the soul resided in the brain, and not in the heart as had been claimed by Aristotle. Vesalius emphasized that the cavities of the brain are the seat of cerebral function, which depends on the formation of the animal spirit (from

anima, the soul) by a "coction" in the ventricles, and the transmission of this *spiritus* to the muscles and other parts of the body by the nerves acting as connecting tubes similar to the action of the veins and arteries. Having explained that he cannot describe any experimental dissections of the brains of animals because of opposition by the church, he recites, as if from his experience with accidental fractures of the skull of man, the results of opening the ventricles of the brain, and closing them again. One may suspect that Vesalius is not wholly frank, and that this alleged knowledge comes in large part from experiment on animals, probably performed in secret and similar to those reported by Galen some thirteen centuries previously, but as he gives no clue to the incisions made or to the position of the injuries to the brain tissue by which the interior of the cerebral ventricles is exposed, it is impossible to draw in terms of modern cerebral physiology any inferences from his text as to what symptoms should follow the cases which he suggests that he has seen.

Vesalius accepts the Galenic theory that the veins carry nutritive blood with its natural spirit from the liver through the whole body, and that any part loses nourishment in which a principal vein has been accidentally cut. He considers it necessary to reaffirm the teaching of Galen, that the arteries contain blood, by demonstrating the presence of blood in the arteries during life by the simple experiment of cutting an artery in a living animal. Vesalius also denies that vivisection is required to prove the function of the arteries, and follows the teaching of Galen that these vessels carry from the heart to the distant tissues the blood plus the vital spirit which has been furnished to it in the left ventricle of the heart. He then proceeds to describe a careful experiment proving that the blood plus this vital spirit can reach the foot through a cannula inserted around a ligature of the femoral artery. Vesalius fails to try the same experiment with a cannula on a vein, or even with a ligature, and therefore learns nothing newer than the physiology of Galen concerning the circulation of the blood from

his vivisections, although his experiment, if understood, proves the circulation of the blood. The results of tying a vein were recorded first in print by Caesalpinus in 1571.

Nevertheless, Vesalius revolts from the opinion of Galen, and expresses doubt concerning the existence of pores in the septum of the heart. He says, in both the first and second editions, "The surface of each ventricle is extremely uneven and beset with numerous pit-like indentations deeply sunk in its fleshy substance. These pits, however, are not confined to the side by which the right ventricle corresponds with the left (notwithstanding it is so understood by all other anatomists), but are found over the whole ventricular surface" (Translation by John C. Dalton). Vesalius continues in the first edition, "From these pits none which it is permitted to appreciate by the senses penetrates from the right ventricle into the left. So much are we forced to admire the diligence of the creator of all things in a healthy manner by which the blood exudes from the right ventricle into the left through passages which escape vision," and in the second edition he is equally or more positive, thus: "Nor do I find even the minutest channels which would make the septum pervious, although such perforations are described by anatomical professors, who believe implicitly in the passage of blood from the right ventricle into the left. I am therefore in no little doubt as to the function of this part of the heart" (Translation by John C. Dalton). Vesalius appreciates the fact that blood must go from the right side to the left side of the heart. Galen had appreciated this fact also, and had assumed the existence of the pores in the cardiac septum but Vesalius has no explanation to offer.

The true course of the blood from the right heart to the left heart through the lungs was first described in print by Servetus in 1553, which however did not become generally accessible until 1694 when William Wotton published his *Reflexions upon Ancient and Modern Learning*. Servetus was burned by John Calvin for the religious heresies printed in the same book, and only two complete copies of

the edition survived the same fire. Seivetus was a friend of Vesalius, and yet in the second edition of the treatise published only two years after this *auto da fe* Vesalius does not even hint at the pulmonary circulation, and we must suppose that he was ignorant of this discovery of his friend.

At the age of twenty-nine, Vesalius resigned his professorship and studies in science, and took the post of court physician to the Emperor (1544). For twenty years (1544-64), Vesalius apparently gave up all thought of his early work in science, and busied himself with the duties of personal attendance on the Emperor Charles V and his son, Philip II. He lived in the atmosphere of the court as this monarch traveled from Austria and Germany through France, Holland and Italy to Spain.

Vesalius saw the results of the publication of his book written after his long apprenticeship in the dissecting theater. Both applause and condemnation from many contemporaries appeared according as the critics supported the Galenical tradition or the new anatomy of Vesalius. He entered into few controversies with his critics. In the minds of his old teacher, Sylvius, in Paris, and Johannes Dryander in Marburg, Vesalius stood for an insane upstart. By Mathaeus Columbus both in Pisa and in Rome, and later by Bartholomeus Eustachius in Rome, he was criticized as a teacher of error.

The smaller book of Vesalius, known as the *Epitome*, was reprinted also by Oporinus at Basel in the German language from a translation by D. Albanus zum Thor in the same year, 1543, and issued August 9. This is now equally rare with the Latin original, and copies often have lost the frontispiece. It is dedicated to Philip of Spain, and also to Christopher, Duke of Württemberg and Teck. A partial reprint of the plates of Calcar called a *Compendiosa totius Anatomie delineatio* was printed in London by John Hertold in October, 1545, in which Thomas Geminus has reproduced some of the plates from the Treatise and *Epitome* by engraving on copper. In these, the drawings of

the muscles are the same but the background different. Geminus republished this book in 1553, and with an English text by Nicholas Udall in 1559, which is shown by Sanford V. Laikey to be derived from Mundinus and Vicary except as to the copper plates. The English text of Geminus has no connection with his own first pirated edition of the "Epitome" of Vesalius. The first edition was dedicated to Henry VIII, and has the royal coat of arms on the title page, the second, to Edward VI, with the same title page, and the third, to Elizabeth. In this edition, the royal effigy replaces the arms of Henry VIII and Edward VI but the portrait resembles that of Mary, the elder sister of Elizabeth, for as Laikey points out, an old note in a Bodleian copy says that Mary died just as the book was being printed and there was no time to change the portrait to correspond with the dedication. No translations of the larger treatise of Vesalius have been published in English.

Vesalius undoubtedly resented the criticism of Columbus more than that of any other contemporary. Mathaeus Realdus Columbus was the prominent and foremost assistant of Vesalius in Padua for six years (1538-44). He carried on the duties of teaching at Padua while Vesalius was absent in Basel at work on the publication of his first edition. Columbus also succeeded to the Patavian professorship when Vesalius left in 1544 to take up the duties of Archiaterus and court physician to Charles V. Vesalius spoke highly in his first edition of his first assistant, Columbus, as "my friend Columbus, skilled professor at Padua, most studious of anatomy," and included a portrait of Columbus as his first assistant in the front rank of the attendants at the portrayal of his public anatomy in the well-known frontispiece of his treatise.

Columbus was born at Cremona in 1494. Like Vesalius, he was the son of an apothecary, and trained in that calling. He did not have as thorough a university education as his contemporary anatomists but he expressed himself clearly, and wrote Latin in a finished style. He was twenty years the senior of Vesalius, and subsequent events lead one

to believe that this difference in age created a feeling of envy and secret antagonism against Vesalius as a younger man who was getting more credit than he deserved. As soon as Vesalius left Padua for the imperial service, and Columbus succeeded to the professorship, he showed his true colors, attacked the anatomy of the Vesalian treatise and began to demonstrate in his anatomies examples of anatomical arrangement which resembled those of Galen more than the written word of the Vesalian anatomy of 1543. Any thoughtful student of anatomy today cannot but be impressed with the multiplicity of variation in the structure of the peripheral arteries and veins, of the nerve trunks and of the muscles, in different human cadavers. The very complete *Handbuch der Systematischen Anatomie des Menschen* (1866-71) of Jacob Henle has been looked upon for many years as the last word concerning these anomalies of anatomy. After Columbus transferred to Rome and was joined there by Eustachius, the attacks on Vesalius increased many fold. Columbus with his forced references to Galen, and Eustachius with his more learned comparisons and references to fetal anatomy, aroused Vesalius to bitter counter attacks on these two critics. From his language one might suspect that Vesalius could be a difficult man to please and a hard taskmaster, and that many fancied injuries and insults had rankled in the soul of Columbus. Vesalius hurls at his late assistant such epithets as, "an uneducated being," "a half wit," "a boaster that he had discovered a vein overlooked by me in an unfinished dissection," and similar retributions and angry criticism.

Vesalius found time to leave his court duties for a short period during 1545 and 1549, during which he visited Padua, Pisa, Bologna and Basel, and conducted public anatomies at these universities. Under the influence of personal attacks and disputes, he burned all his manuscript notes and writings in a fit of temper, and followed Charles V to Madrid. It seems probable that Vesalius rewrote his treatise in 1551 while attending on the Emperor at Augsburg. This second edition was printed in large part by 1552,

though dated in 1555, and was published largely as an answer to his detractors. Columbus wrote but one book, which was not published until 1559, just after his own death. This book is palpably modeled after the treatise of Vesalius. It also contains a chapter on vivisection in which Columbus presents no new facts but limits his work to repeating some of the experiments described by Vesalius. Columbus gives the preference to the use of the dog in vivisection as compared with the hog, and for the reason that swine make too much noise under the knife, thus reversing the opinion of Vesalius who preferred the pig because the dog was too quiet. In his book Columbus emphasized that he had discovered the third small ossicle of the ear, and also the pulmonary circulation which he described accurately. Unfortunately for the reputation of Columbus for veracity, the stapes of the ear had been described by both Philippus Ingrassias of Sicily and professor at Naples, and by Bartholomeus Eustachius who relinquished all credit when he heard that Ingrassias had also made the same discovery.

The question of the priority of the discovery of the pulmonary circulation is a much more complicated question to attempt to solve at this date. During the twelve years (1543-55) between the printing dates of the first and second editions of the Vesalian Treatise, this primary discovery of the lesser circulation was published by Servetus (1553). In reading the original texts of Vesalius and his contemporaries, one must remember that all these anatomists, like Vesalius himself, were skillful observers and described, as accurately as their knowledge would allow, the exact findings as they understood them. The science of the sixteenth century dealt with observed facts, and did not trouble itself with inferences from those facts or with theories of any kind, except in studies and publications on theology.

The established theories of the Galenic physiology of the humors taught the differences between the dark-colored nutritional blood of the veins containing "natural spirit," and the lighter colored spirituous blood of the arteries con-

taining "vital spirit" The blood vessels entering and leaving the heart were classified according to the character of the contained blood with no knowledge of the real direction of the flow of the current in those vessels or of their intimate structure The pulmonary artery of today containing dark "nutritional blood" was called the arterial or artery-like vein or *vena arteriosa*, and the pulmonary veins containing bright colored arterial blood were named venous or vein-like arteries or *arteriae venosae* According to the humoral physiology the flow of blood in all arteries and veins alike was thought to be an alternating to and fro current from the heart to the lungs or to the periphery of the body, and back again These observers of the sixteenth century were influenced by this theory of Galen and by the constantly observed to and fro flow of air in the windpipe, the *arteria aspera* of the lungs

The spirits of the humoral philosophy of life were three—the "animal," the "vital" and the "natural," and life was carried on by the soul acting through these spirits Much stress was placed upon the location of the soul in the body Aristotle had placed the seat of the soul in the heart, Galen had transferred its seat to the brain The materialist philosophers of the sixteenth century who developed the knowledge of the structure of the human body, and led up to the discovery of the circulation of the blood as proved and published by Harvey, located the soul in the blood The soul of these philosophers was not the immortal spirit of Plato and the theologians but the *anima* of the Roman, the *psyche* of the Greek This soul carried on life, and manifested intellect, volition, sensation and motion through the animal, or possibly better, cerebral spirit of the brain and nerves, it governed the nutrition, growth and repair of the body through the natural spirit of the venous blood, and it controlled through the vital spirit of the arterial blood the most prominent functions of arteries and all living tissue, viz, their inherent power to pulsate

This function of pulsation existed in every organ, and was the continuing evidence of the existence of life The

Galenic theories of life explained this pulsation in the organs of circulation of the blood as a process of suction. The heart was a suction pump, and not a force pump, the swelling of the arteries sucked the blood into them from the heart, the swelling of the pulsating brain sucked air to itself through the cribriform plate of the ethmoid bone, and natural and vital spirits also from the veins and arteries, from which combination the animal spirit was produced by "coction" in the ventricles of the brain. The physiology of the humors laid stress upon the functions of the cavities of organs rather than upon their solid substance. The more or less mystical changes in the blood due to the interchange of oxygen and carbon dioxide gases in the pulmonary parenchyma by which the vital spirit entered the blood, were explained as caused by this specific action known as coction in the left ventricle of the heart. This physiology demanded that all cerebral activity and the formation of animal spirits be a function of the cavities of the brain, and that this animal spirit be transmitted to the skin for sensation, to the muscles for motion by the cavities in the nerves. That these nerves were found to be solid after death did not disturb the acceptance of the theory of the existence of invisible channels in them any more than the absence of demonstrable pores in the septum of the heart destroyed the accepted notion that the blood oozed or filtered through that septum from the right to the left ventricle. Vesalius in his second edition was the first to deny the existence of these septal "foramina" in the heart but he did not follow this discovery to its logical conclusion, and formulate the lesser or pulmonary circulation.

Leonard L. Mackall has reported on the literary remains of Michael Servetus. Servetus was probably born in Tudela in Navarre but his parents lived in Villaneuva de Sigüenza, Spain. He was a fellow student of Vesalius at Paris under Sylvius and Guinterius, and took his degree of Doctor about 1540, probably at Montpellier. He was more interested in theology even than in medicine. His principal writings were two—the Errors of the Trinity, *De Trinitatis erroribus Libri VII* (1531), and the Re-establishment of Christianity,

Christianismi Restitutio (1553) His heresy was a peculiar unitarianism which was equally abhorrent to Roman Catholicism and to Calvinism. It was Calvin who brought about his execution at the stake in Geneva. Servetus was unquestionably familiar with the anatomical treatise of his fellow student, Vesalius, and he also denied the existence of the septal pores in the heart. Servetus seems to have worked out the fact of the lesser circulation for himself. He introduced into his last book a discussion of the nature of the Holy Ghost which included his accurate description of the pulmonary circulation as a physical explanation of the formation of the "spirits" of the body from which the Holy Ghost is established in the body of man. He wrote

There is the vital spirit which is introduced by anastomoses from the arteries into the veins in which it is called natural. First, therefore there is the blood whose origin is in the liver and the veins of the body. Second, there is the vital spirit whose origin is in the heart and the arteries of the body. Third, there is the animal spirit whose origin is in the brain and the nerves of the body.

In order that one may understand how the blood is life itself, one must recognize the physical formation of the vital spirit itself, which is compounded and nourished from the inspired air and the most refined blood.

This thin spirit is endowed by the force of heat with a golden yellow color in order that the transparent vapor may be containing in itself, as it were from the more pure blood, the substance of water, of air and of fire. It is formed, as a matter of fact, in the lungs by a mixture of inspired air with the delicately prepared blood which the right ventricle of the heart sends to the left. This communication indeed is made not through the central wall of the heart, as is popularly believed, but the refined blood is driven through a great ingenuity by the right ventricle of the heart in a long route through the lungs. Thus not simply air but air mixed with blood is sent by the lungs to the heart through the vein-like artery. Therefore this mixture is made in the lungs. The bright color is given to the refined blood in the lungs, not in the heart.

One thousand copies of the first edition of this publication by Servetus were printed for him at Vienne, France. Calvin and the authorities of the Church of Rome tried but failed to destroy the whole edition, and complete copies are now in the State Library at Vienna and the Bibliothèque Nationale in Paris, and an incomplete copy in the University library at Edinburgh. It is known that about 1546 Servetus

sent a copy of this book in manuscript to Calvin at Geneva, and it has been repeatedly thought probable that he also sent a similar copy to his friends in Italy, and that Columbus and others might well have seen or heard of the passage about the circulation. Mackall has examined much of this material, including a manuscript of 1546 of Serretus, but not in his handwriting, which is now in Paris, and which contains the passage relating to the circulation through the lungs. Mackall traces this manuscript back through the La Vallière sale (1784), and the collections of Gaignat, Hoym and Du Fay to a Caelius Horatius Curio, "percelebris bibliopola Basiliensis." The chain is broken at this point, and it seems very uncertain that this bookseller of Basel was any connection of the son of Caelius Secundus Curius, the theologian, who moved to Switzerland from Pavia and Lucca in 1545 because he sought freedom from possible religious persecution in Italy. It must remain an unsolved question but it seems by no means impossible to many that the discovery of Serretus was available to the scientific workers at Padua either before or after 1546 through the aid of the friend of science and of the University, Caelius Secundus Curius, who may have owned this manuscript, or possibly a copy was seen and read by Columbus. I have indicated below a much easier and more plausible manner in which Columbus could have learned of the pulmonary circuit.

Modern writers have been divided in their estimates of Columbus as a reliable observer. John C. Dalton, writing on the doctrines of the circulation in 1884, however, gives him full credit for this discovery of the pulmonary circulation. The exact words of Columbus show that he believed that much of the venous blood going to the lungs was designed solely for the nutrition of the lungs, and that a portion of that blood only was transformed into the highly refined, brilliantly colored blood containing the vital spirit, and returned to the heart.

Sn. Michael Foster, however, in his history of physiology published in 1901, gives little credence to the claims of Columbus to priority of discovery of the lesser circulation,

and bases his objections on the proved dishonesty of Columbus. Columbus in his book of 1559 tried to appropriate credit from Ingliassias for the discovery of the third of the aural ossicles (the stapes), and Sir Michael emphasizes that Columbus could easily have seen a copy of the book of Servetus or a manuscript copy at Padua in or about 1546. It cannot be denied that the words of Columbus give the best description of the pulmonary circulation printed before the epoch-making book of Harvey.

Columbus says in his chapter "De corde et arteriis"

Between these ventricles there is a septum through which almost everyone considers that a passage for the blood exists from the right ventricle to the left in order that it may be made more easy for the fine generation of the vital spirit to be restored. But they wander in a long road, for the blood is carried to the lungs by the arterial vein and is refined there, and then together with the air is returned to the left ventricle of the heart by the venous artery.

and later in his chapter "De pulmone," Columbus says

In truth, these three vessels, arteria aspera, vena arterialis and arteria venalis (trachea, pulmonary artery and pulmonary vein) are embraced by a thin, porous and light substance, and thus the lungs are formed. The function of which is, as the anatomists correctly describe, the cooling of the heart by carrying cold air to it, besides the lung is compelled to act in inspiration and expiration, and so is useful for the voice. And those writers, who antedated me, renewed all these uses of the lungs, in addition to which I add another of the greatest importance concerning which no one has made mention. In fact, this is the preparation and almost the generation of the vital spirit which is later perfected largely in the heart. For this takes the air inspired by the nares and mouth which is carried by means of the arteria aspera (trachea) through the whole lung, in truth the lung mixes this air together with that part of the blood (co sanguine) which having been perfected is conducted from the right ventricle of the heart by the arterial vein. Indeed, the arterial vein carries what blood is used for its nourishment (of the lung,) and in addition is sufficiently large so that it can supply blood also for this additional function.

The chapter of Columbus "De viva sectione" was translated into English by Louis C. Boishnière, and published in the *St. Louis Medical Review* in October, 1906. One will seek in vain for any description of the pulmonary circulation in this chapter. The above excellent description of the lesser circulation is found in his chapters, "De corde et arteriis"

and "De pulmone" Today one cannot imagine that Columbus could have omitted to describe the pulmonary circulation in his account of his extensive vivisections of the chest and abdomen of the living dog if he had had the slightest notion of the general circulation. A source of this information available to Columbus was nearer to his elbow than any theoretical guess referring to a secret understanding by him of the writings of Servetus. John Calvin was almost successful in blotting out this description from the memory of the general medical profession by his destruction of Servetus and his book.

Columbus had two resourceful students or assistants in his laboratory at Rome. Bartholomeus Eustachius and Andreas Caesalpinus. I must confess that the honesty of Columbus seems to me to be more than questionable. To recapitulate, Columbus is reputed to have stolen credit for the discovery of the stapes from Phillipus Ingrassias, and undoubtedly took credit for the discovery of the pulmonary circulation. Subsequently, the credit for the stapes was returned to Ingrassias by the actual co-discoverer, Eustachius, who had made special studies of the middle ear and whose name is attached to the tube connecting the middle ear with the pharynx. I believe that Columbus stole from both of his assistants: the stapes from Eustachius and the pulmonary circulation from Caesalpinus.

The description of the pulmonary circulation was later printed by Caesalpinus in at least three books: *Quaestionum Peripateticarum, Libri V*, 1571, and 1593, *De Plantis, Libri XVI*, 1583, and *Quaestionum Medicarum Libri II*, 1593. Caesalpinus said in his Peripatetic Questions in 1571 and 1593:

For that purpose, the lung drinking up the heated blood from the right ventricle of the heart through the artery-like vein and passing on that blood (cam) through anastomoses of the vein-like artery which goes to the left ventricle of the heart, the cold air having been sent meanwhile through the channels of the rough artery (trachea) which proceed next to the vein-like artery, it cools by touch alone, not indeed by communicating openings, as Galen thought. Those things which appear in dissections agree best with this circulation of the blood from the right ventricle of the heart through the

lungs into the left ventricle of the same. For there are two vessels designed for the right ventricle, one admits the same quantity as the other extracts, the membranes (valves) having been made for that purpose. Therefore the vessel emptying into the right is the great vein which is called cava (*Quaestionum Peripateticarum*, 1593, Liber V, f. 125 verso)

He repeated his theory of the circulation in the *De Plantis*, 1583, thus

For in animals we see that nourishment is carried through the veins to the heart as if to the workshop of innate heat which is originated in the heart from the same food and is developed there to its final perfection to be distributed through the whole body in the arteries, by the driving spirit which is formed in the heart from the same food — (*De Plantis*, Liber I, 1583, p. 3 recto, Cap. II, ll. 2-5)

In *Medical Questions*, 1593, Caesalpinus says

That the openings of the heart are prepared by nature in such a way that an entrance is made from the vena cava into the right ventricle of the heart whence an exit opens into the lungs, that there is besides an entrance from the lungs into the left ventricle of the heart from which finally an exit opens into the aortic artery, certain membranes having been placed in the openings of the vessels that regurgitation may not occur. For thus there is a continuous movement from the vena cava through the heart and lungs into the aortic artery, as we have explained in the peripatetic questions — (*Quaestionum Medicarum*, Liber II, 1593, f. 234 recto)

Thus Caesalpinus described on three occasions both the pulmonary and the general circulations as viewed from the flow of blood through the heart on both the right and the left side. But he could not drop the theories of Galen concerning the physiology of life and its pulsations. For him as for all his predecessors and contemporaries the blood flows because the lung drinks it up, or better sucks it up from the right heart, the arteries suck it from the left heart and the left heart sucks it from the lungs, and the right heart sucks it from the venae cavae, superior and inferior (to use modern nomenclature). Caesalpinus first demonstrated by ligatures that the flow of blood in the veins was centripetal, and that in the arteries was centrifugal so far as the heart was concerned.

All these facts must have been known generally in Italy when William Harvey, the Englishman, arrived in Padua

to study under Fabricius in 1599. He remained there three years. After returning to London he became a lecturer and taught the circulation of the blood to his classes during and after 1616 as it is taught today. He did not publish his book, *De motu cordis et sanguinis in animalibus*, until 1628. When criticised by many, by Sylvius in Paris and Riolanus in Amsterdam, on the general demurrer "cur bono? It cannot be right," his general answer was "I do not know, that remains to be seen." But when one reads today the seventy-two pages of his little book, and one finds vivisection raised to a modern plane of excellence, one must honor an author who knew the value of animal experimentation, and appreciated that he had proved the dual circulation of the blood by that means.

Harvey's great discovery was not so much this double circulation "Motus sanguinis" but its cause "Motus cordis." He likened the action of the heart to a water pump, and thus the heart became a force pump, the arteries, elastic tubes which pulsated under the recurring impulses of the pumping heart.

In the opinion of the writer, the credit for the discovery of the circulation of the blood belongs to William Harvey. The claimants for the honor are many. Caesalpinus is the most prominent and there are others in Italy, in Spain and elsewhere. A recent claimant has been groomed in *Quellen und Studien zur Geschichte der Natur-Wissenschaften und der Medizin* (Vol IV, No 1), by Max Meyerhof and Tatawî in the person of Ibn an Nafî of Persia, as presenting a theory of the pulmonary circulation in the thirteenth century. Ibn an Nafîr was born at Damascus in 1210 A.D. He opposed the anatomy of Galen and Avicenna by denying the passage of blood through the heart septum at the same time affirming the necessity of a flow of blood from the right heart to the left which, entirely on theoretical grounds, he believed must be through the lungs. He described no experiments. As usual Meyerhof and Tatawî suggest that Serretus might have heard in Spain of this Persian. Among these claimants one must remember that the

world knew nothing of Serretus or his discovery until 1694, one hundred and forty-one years after his death, when William Wotton called attention to this theory of the pulmonary circulation in his *Ancient and Modern Learning*. That the claim of Caesalpinus was not known until Bayle presented it in his dictionary in 1695, one hundred and twenty-four years after its publication in the Peripatetic Questions. Harvey has been criticised because he does not mention the source of his first dream on the circulation. The answer is that he mentions in his book, Columbus, Fabricius and Laurentius, a competent, to him recent writer on the history of the circulation (1610). Harvey had no discussion with the dead but devoted all controversy to oppose Joannes Riolanus of Amsterdam, who was the greatest living up to date exponent of the Galenic theory of circulation by the pulsation of the organs of circulation during their diastole.

All such questions are answered by Sir William Osler in his monumental catalogue when discussing the question of priority in regard to the introduction of anaesthetics. At no. 1354 Osler quotes Richard Owen and Francis Darwin on priority in scientific discovery:

He becomes the true discoverer who establishes the truth, and the sign of the truth is the general acceptance. Whoever, therefore, resumes the investigation of neglected or repudiated doctrines elicits its true demonstration and discovers and explains the nature of the errors which have led to its tacit or declared rejection may certainly and confidently await the acknowledgments of his right to its discovery"—Owen (*On the archetype and homologies of the vertebrate skeleton*, London, 1848, p. 76).

In science, the credit goes to the man who convinces the world, not to the man to whom the idea first occurs—Francis Darwin (*Eugenius Reclow*, 1914).

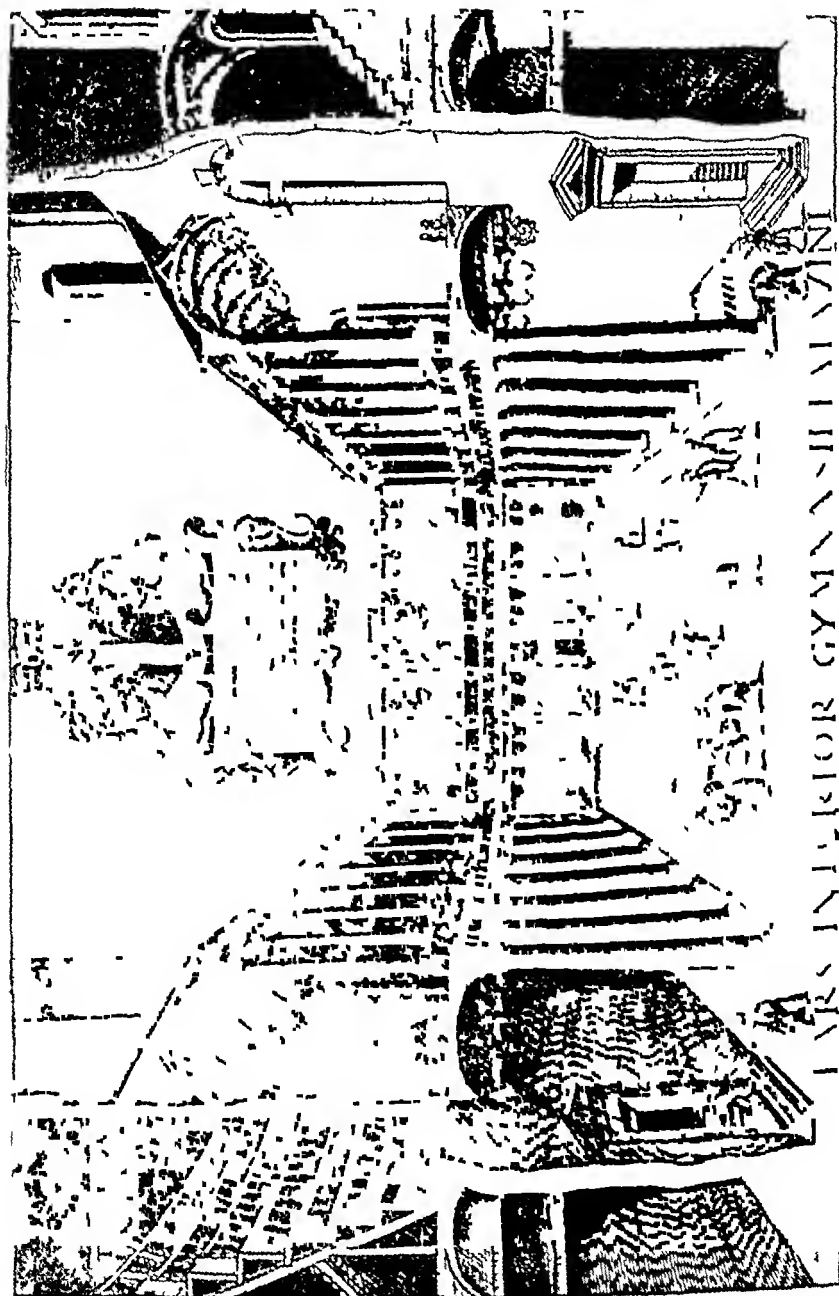
Another important discovery was that of the valves in the veins, made but not published by Joannes Baptista Cananus in 1536, but first published by Hieronymus Fabricius ab Aquapendente in 1603. The proof of the existence of these folds was a final convincing evidence of the circulation to one who could understand it but Fabricius explained their use and function as furnishing a check to slow the centrifugal flow of blood in the vein in

order that the blood might be the more equally distributed through the body, and not collect unduly in the lower extremities

Vesalius and his proof of the impermeability of the cardiac septum, Serretus and his correct description of the pulmonary circulation, Columbus and his "rediscovery" and correct reiteration of the discovery of Serretus, Caesalpinus and his demonstrations of the centrifugal flow in arteries and the centripetal flow in veins and the correct description of the flow of blood through the heart, and Fabricius with his valves in the veins, all failed to formulate the one important fact that the whole blood flowed in two circles, a shorter through the lungs, and a longer through the rest of the body. They failed because they could not see or feel the connecting vessels between the arterial and venous trunks, and would not abandon the humoral physiology and the theory of suction by pulsation of Galen and other predecessors who had assumed the existence of invisible channels between the arteries and veins, but who had viewed this flow of blood as pathological and to be from veins to arteries, and thus to form a prominent cause of disease.

A large part of these investigations were carried on in Padua by the successive incumbents in the chair of anatomy. This succession was as follows: Vesalius, 1537-44, Columbus, 1544-46, Fallopius, 1548-62, Fabricius, 1564-1604, and later the same traditions were continued by Julius Casserius, 1604-16, and Adrian Spigelius, 1616-25.

These Anatomical demonstrations of Vesalius, or anatomies as they were called, were not held in any large hall or amphitheater with elaborate architectural decoration such as is depicted both in the frontispiece of the *de Fabrica* by Vesalius and in that of the anatomical books of Columbus. On the contrary, the early lectures of Vesalius were given in a wooden structure built especially for the purpose. The present building of the University at Padua was first used in 1549 while Fallopius was Professor of Anatomy. The illustration of this building shows the interior of the court



Medical Building of the University of Padua

and a section of the anatomical lecture room in the left part of the upper story of the building. The broadside from which this is taken is printed anonymously, and is dated 1601 at which time Harvey was a student at Padua under Fabricius. The interior is unchanged at the present day. There are no seats, and the audience stood in six rows behind a railing on which books or elbows may be rested—a condition not unknown in the older medical schools of America forty years ago. The guide of the building tells modern visitors of the troubles of the students and professor in securing human bodies for the dissection, and the necessity of keeping a watch for inspecting officers of the law or the church. He points out a small opening from which all visitors may be inspected as they approach, and also the facilities for hiding the cadaver. His enthusiasm leads this guide to affirm that as soon as the anatomical subject had been disposed of by dropping it through a trap, the audience and professor would produce musical instruments, and transform the whole assembly into an orchestra at practice. Such a condition certainly did not exist in the time of Vesalius, and this modern cicerone is more amusing than convincing of the truth of his reminiscent history. It is in the corridors of the court shown in this advertisement of university lectures that the heraldic cartouches of former students, including that of William Harvey, are still to be seen.

Vesalius and his contemporaries had no knowledge of the function of respiration in regard to the absorption of a gas from the air, and of the exchange of oxygen and carbonic acid gas in the lungs. This knowledge was not available until after the death of Harvey (1578-1651), when Boyle had invented the air pump, and experimented with its vacuum, and Mayow (1643-79) had advanced the theory of an absorption by the blood of a nitro-aerial spirit from the inhaled air.

The immediate followers of this Italian school of anatomy of the sixteenth century continued to advance new theories and new observations. Felix Platei in his *De corporis*

humani structura et usu Basel, 1583, formulates the alternating suction action of the heart, of the lungs and of the arteries with the acceptance of the pulmonary circulation. He describes the formation of the spirituous blood in the lung, the suction of the venous blood by the lungs synchronous with the contraction of the heart, and the suction by the heart during diastole of the spirituous blood from the lung into the left ventricle. Caspar Bauhinus of Basel in his *Theatrum Anatomicum*, Frankfurt, 1605, repeats the theory of Galen that the blood passes from the right ventricle to the left through the septum of the heart. Gabriëlis Fallopius at Padua in his *Institutiones Anatomicae*, Venice, 1584, omits all mention of the pulmonary circulation and continues the theory that the vital spirit is "concocted" in the left ventricle of the heart, that the arterial vein supplies the lungs with a finer quality of blood, and the venous artery carries fuliginous matter from the left ventricle to the lungs and brings back air prepared in the lungs for the cooling of the heart. Fallopius reasserts the complete theory of Galen, and dodges by silence all reference to a pulmonary circulation and to septal pores in the heart. Leonardo Botalli in a special paper (1565) described a series of cases of congenital persistence of the fetal duct now known by his name. This was republished in his *Opera omnia*, 1660. Botalli believed that he had discovered the "lost passage" from the right to the left heart by which the blood found its way from right to left and neither through the arterial vein nor through the cardiac septum. Constantius Varolius in *De resolutione corporis humani, Libri IIII*, Frankfurt, 1591, expresses the belief that, following the arrangement of the fetal circulation with its two umbilical arteries and one umbilical vein, the portal vein absorbs the material for the formation of venous blood, and the mesenteric arteries absorb the constituents to produce arterial blood, and transmit the same to the vena cava and the aorta respectively. Thus he eliminates all idea of the passage of blood from the right to the left heart within the chest. Franciscus Ulnus introduced the spleen as the organ intermediate between the veins and arteries, but none of these wend theories

received supporters, and in spite of their important discoveries every one of these brilliant minds of the sixteenth century remained too firm believers in the Galenic theories to be able to grasp the great facts which they all saw but could not explain

It remained for the Englishman, William Harvey, to complete the proof after his return to England from a course of study of a few years (1599-1602) at Padua under Fabricius

Between the dates 1562 and 1564, Vesalius undertook his ill fated journey to Jerusalem. It seems improbable that this was begun to appease the Church and the inquisition of Spain. The report that it was to purge himself of the impiety of having opened a living body to determine the cause of death, has been repudiated as an untrue calumny by the best informed historians of this period (Haeser, Roth and others). Vesalius had been subjected to bitter criticism, engendered largely by jealousy, from the physicians of Spain. He was protected by the influence of Charles V and also, but to a much less degree, by Philip II. In 1556 Charles had referred the whole question of the dissection of the dead to the theological faculty of Salamanca who gave the following decision

"Since such dissection was indispensable in the opinion of physicians for the increase of knowledge of the healing art, it must therefore be considered as necessary."

It seems more likely that Vesalius became thoroughly disgusted with the treatment of him by the churchmen of his time, and with the priest-ridden government of Philip II, and made the excuse of a pilgrimage to the Holy Land to secure from Philip his discharge and release from his duties as court physician. While in Jerusalem he received word that he had been appointed by the Council of the Venetian Republic to the Professorship at Padua, to succeed Fallopius who had died in 1562. On his return journey his ship was wrecked on the coast of the Island of Xacynthos (Zante), and Vesalius died from the results of the exposure in October, 1564, at the age of fifty.

Vesalius described in his final chapter of the *de Fabrica* on vivisection the method of tying up an animal for a demonstration in vivisection in a public lecture, and refers to the instruments necessary for such a piece of work. An illustration of these instruments exhibited on a vivisection plank is shown at the end of the first book of the treatise.

Vesalius then closes his *de Fabrica* treatise (*historia*) by describing an operation on a living pig which includes all the separate experiments previously detailed. The drawing of the pig tied to the dissection plank is reproduced above, in the Latin version of this chapter, and in its translation.

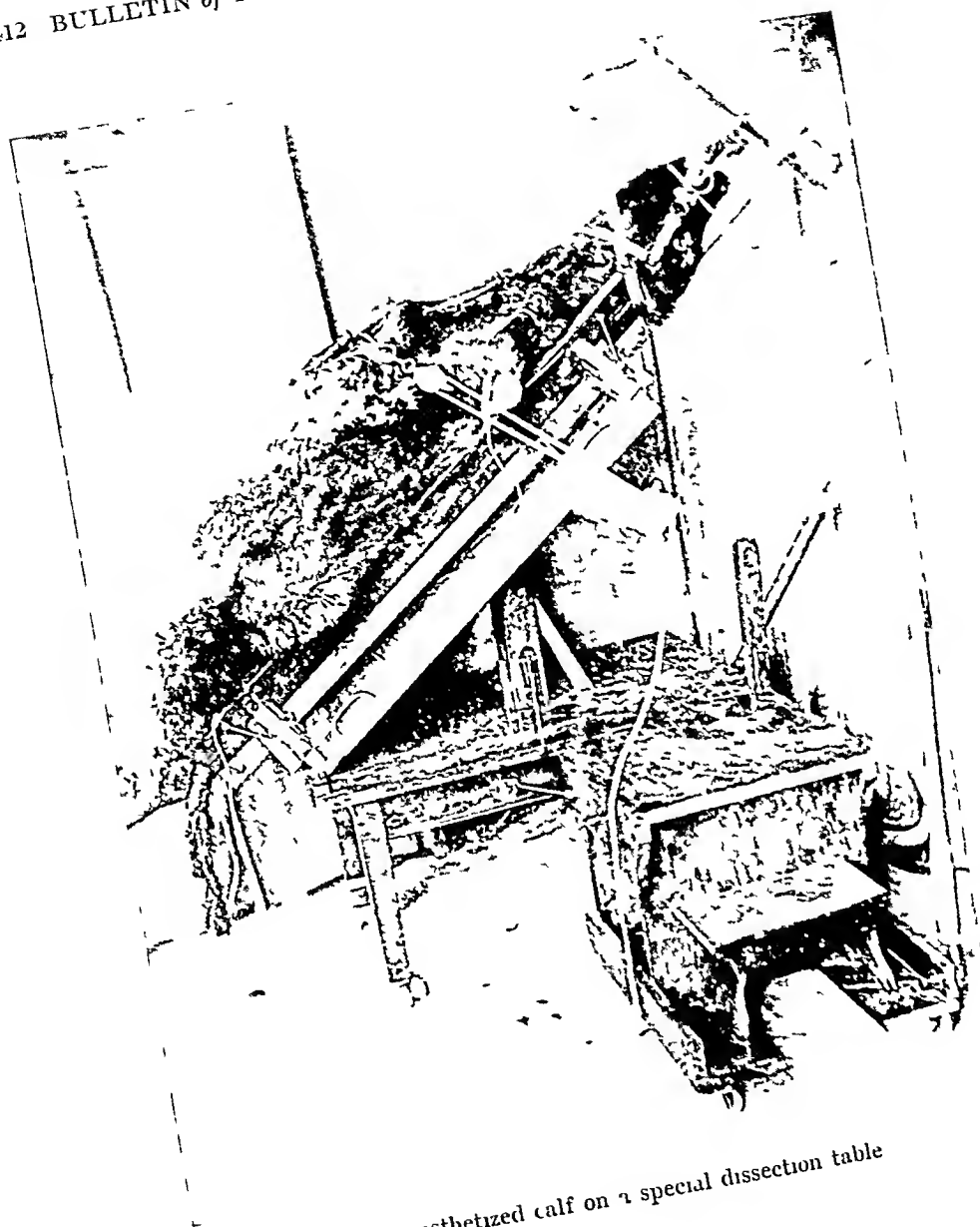
In this vivisection Vesalius proves the function of the recurrent nerves of the larynx which was first discovered by Galen. He then examines the movements of the lung in respiration, and compares the rhythms of the pulsation of the heart, of the aorta, of the pulmonary artery (artery-like vein), and of the pulmonary veins (vein-like artery). In spite of his keen power of observation which had served to break down the application to man of the simian anatomy of Galen, Vesalius misses the true meaning of the heart beat and the arterial pulse, and he reiterates the Galenic functions of the vena cava and other veins as distributors of nutritious blood to the whole body, and gives no hint that he had ever heard of the description of the pulmonary circulation by Servetus.

A similar experimental demonstration was carried out by the late Professor John G. Curtis as a part of his annual course of lectures on physiology at the College of Physicians and Surgeons in the years of his active professorship (1876-1909). There were a number of red-letter events in undergraduate medical education in New York during the closing years of the nineteenth century which attracted students from all the schools of the regular profession in the city. There were four such schools: The College of Physicians and Surgeons at Twenty-third Street and Fourth Avenue, The Woman's Medical School of the New York Infirmary at Fifteenth Street and Stuyvesant Square, The New York University and the Bellevue Hospital Medical Schools, both

of which were at the foot of Twenty-sixth Street and the East River. Such outstanding clinics and lectures included the Saturday Surgical Clinics of James Wood at Bellevue, of Thomas M. Maikoe, Robert F. Wen and William T. Bull at the New York, and of Henry B. Sands at the Roosevelt Hospital. Students from every school flocked each week and were welcomed to these public clinics which were conducted after the model of the celebrated Hospital Clinics of Paris.

Once a year, "calf day" at 10 a. m. attracted a similar congregation of students of both sexes from all the schools of the city to the old lecture hall of the College of Physicians and Surgeons. At this lecture Professor John G. Curtis would operate on a yearling calf which, after being anaesthetized, was held in a special frame, and kept alive by artificial respiration.

Professor Curtis in accordance with what is and always has been the mental attitude of the doctor of medicine, differed with his contemporary teachers of physiology on a number of particulars in his chosen specialty. His great divergence with his chief, Professor John C. Dalton, was a minor one perhaps but the question whether the heart shortened or lengthened in systole, and its relation to the causation of the apex beat on the skin in the intercostal spaces, did not seem trivial to Professor Curtis. Professor Curtis proved to his own satisfaction at this annual sacrifice of a good red heifer on the altar of science that he was right. His students usually split on this question. Some who feared the coming examination were convinced, and others being more inquisitive and perhaps more observant, voted mentally that Professor Dalton perhaps was right. And thus both groups of students proved themselves well along in their psychological training for their doctorate, and received in their first year of study an early lesson in the aphorism: Doctors may disagree without stigma on their intelligence or their judgment. During the hour Professor Curtis could show much of the action of the lungs in respiration, and of the general and pulmonary circulation.



An anesthetized calf on a special dissection table

of which Vesalius and his contemporaries knew so little Professor Curtis would call attention to the fibrillation of the cardiac muscle, especially of the left ventricle, as a precursor of impending death which Vesalius and his immediate successor, Columbus, had previously called to the attention of their students and audiences John G. Curtis was a learned and keen student of the classical languages, and wrote most interestingly and scientifically of the discovery of the circulation, and of the philosophical and physiological ideas in the sixteenth and seventeenth centuries of Vesalius, Caesalpinus, Fabricius and Harvey

One question mentioned by Vesalius which has been left undecided is that of the ethics—of the right and wrong of vivisection Modern experimentation on animals has developed greatly since the sixteenth century, and the universal use of general anaesthesia results in inflicting on these animals no more suffering than is endured by human beings during surgical treatments, usually, less in fact, for they are not allowed to suffer the pangs of convalescence Bacteriology and immunology have added to the older methods of vivisection many valuable uses for experimentation on animals both in determining a correct diagnosis of human illness in individual cases, and in the scientific study of the causation of disease, and of its successful treatment by vaccination, inoculation and the administration of antitoxins The older procedures included demonstrations of the normal physiology of circulation and digestion This early vivisection included also the training of younger graduates for a career in surgical specialties

Recent discoveries from experiments on animals include the application of insulin in the control of diabetes, the use of a liver diet in the case of pernicious anaemia, and the perfecting of the transfusion of blood from man to man The point of attack has changed its character in recent years, and the antiscientists have raised the plea that the dog should be spared because of his friendship for his fellow animal, man, and have concentrated for the present on the saving of dogs from such a fate while leaving the guinea pig,

the rabbit, the white rat and white mouse, the cat, the horse and the monkey to bear the brunt of this sacrifice to the science of immunity as applied to the domesticated animals as well as to man

Yes, the dog is the friend of man, and the human experimenter is the friend of the dog, and has included rabies and distemper in his curative investigations. There are special reasons why the dog cannot be spared. The dog is omnivorous but largely carnivorous, as is man, and his internal anatomy especially of the liver, gastrointestinal tract, pancreas and kidneys is akin to that of man. The dog, as no other animal could, has contributed very materially to the control of diabetes and of pernicious anaemia.

The general run of mankind takes but little real interest in dogs and cats, but uses them as puppies and kittens for the amusement of their children, particularly during a summer vacation, and then in its fickleness turns the poor beasts loose in a hard world to make their own living and wander as vagrants through the outskirts of our cities until picked up by benevolent local associations for the prevention of cruelty to animals. In every year in New York, for instance, over 70,000 dogs and cats are rescued from the life of the friendless hobo, and mercifully murdered without giving these animals an opportunity to die as mercifully for the advantage of the rest of their own race, and for the protection from disease of their only natural friends, the race of man.

In April, 1919, Sir William Osler said in opposition to a dog bill before Parliament that he yielded to no one in his love for the dog but that he had a still greater love for his fellow man, and that there should be a monument in every city to the ideal dog for the work which his kind had done in saving life by becoming the subject of experiment (*Brit Med Jour*, 1919, I, 494)

Inscribed to the Animals of the Laboratory of the Medical
Sciences

Salve! et Vale! I thou pitiable dog
Made noble too by thy great gifts to the
Welfare of the world In the catalogue
Of them which waiting also serve, thou standest
First, with cavy and calf, with coney and cat,
Awaiting as patiently, the will of man
To live or die, as rodent and ape, that
Man, as fittest, may survive, if you all can
With his help solve the problems of his fate
Is it martyrdom? Does it seem curious to man
That thou, having no choice, diest gaily,
Accepting premature death,—without hate?
Thou art never more the friend of man
Than when thou diest for him Ave! et Vale!

RECENT ACCESSIONS TO THE LIBRARY

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Chic, Curriculum Survey Committee, Amer Assoc of Dental Schools, 1935, 112 p
- American Medical Association Council on Pharmacy and Chemistry Glandular physiology and therapy
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34 ed
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Cheltenham [Eng], Burrow, 1935, 107 p
- Zoethout, W D Physiological optics 2 ed
Chic, Professional Press, [1935], 391 p

MEMBERS ELECTED, MAY 7, 1936

Philip Levine	201 Lyons Avenue, Newark N J
William H Boone	Roosevelt Hospital
Samuel Feigin	115 East 61 Street
Bernard Glueck	130 East 39 Street
Kenneth M Metcalf	108 East 79 Street
Samuel Standard	137 East 29 Street

PROCEEDINGS OF ACADEMY MEETINGS

MAY

STATED MEETINGS

May 7

I EXECUTIVE SESSION—a Reading of the Minutes b Election of Members c Presentation of diplomas d Report of Nominating Committee

II THE ELEVENTH HERMANN MICHAEL BIGGS MEMORIAL LECTURE was delivered by The Rt Hon Lord Horder K C V O M D F R C P on the subject Eugenics as a Form of Preventive Medicine

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)

May 21

THE EIGHTH HARVEY LECTURE The Physiology of the Bronchial Vascular System

I deBurgh Daly Professor of Physiology University of Edinburgh

SECTION MEETINGS

COMBINED MEETING OF THE SECTION OF SURGERY AND THE NEW YORK DIABETES ASSOCIATION

May 1

I READING OF THE MINUTES

II PRESENTATION OF CASES—a 1 Resection of carcinoma of the sigmoid colon in a diabetic patient 2 Diabetic gangrene of the toes treated conservatively Fred W Solley

III PAPERS OF THE EVENING—a Mortality in surgical diabetes F W Williams b Criteria and technique in surgery of diabetic lower extremities Thomas J O Kane (by invitation) c The diabetical surgical service a surgical contribution to the treatment of patients with diabetes mellitus Beverly C Smith

IV DISCUSSION—Samuel Standard (by invitation) Louis Bowman (by invitation) Arthur Terry

V EXECUTIVE SESSION—Section of Surgery Election of Section Officers and member of Advisory Committee For Chairman William F MacFee For Secretary Roderick V Grace For member of Advisory Committee Condict W Cutler Jr

SECTION OF DERMATOLOGY AND SYPHILOLOGY—May 5

I EXECUTIVE SESSION—a Reading of the minutes b Election of Section Officers and member of Advisory Committee For Chairman J Gardner Hopkins For Secretary David Bloom For member of Advisory Committee Ray H Rulison

II PRESENTATION OF CASES—Beth Israel Hospital, Good Samaritan Dispensary Sea View Hospital, Miscellaneous cases

III DISCUSSION OF SELECTED CASES

COMBINED MEETING OF SECTION OF NEUROLOGY AND PSYCHIATRY and THE NEW YORK NEUROLOGICAL SOCIETY—May 12

- I PAPERS OF THE EVENING—*a* Spastic pseudosclerosis with a report of its occurrence in three members of the same family, A M Rabiner Discussion Chas Davison, Frank Curran (by invitation) *b* Radiotherapy in encephalitis lethargica, S A Goldberg (by invitation) Discussion E D Friedman, C W Schwartz L H Cornwall *c* The value of psychoanalysis as a therapeutic procedure H T Hyman Discussion Bernard Sachs, Lawrence S Kubie Israel S Wechsler, Abraham A Brill *d* Cardiac psychoses and the symptoms of anxiety, Joseph Wortis (by invitation), Discussion S Bernard Wortis Karl M Bowman (by invitation)
- II EXECUTIVE SESSION—Section of Neurology and Psychiatry Election of Section Officers and two members of Advisory Committee For Chairman, Abraham A Brill For Secretary Irving H Pardee For two members of Advisory Committee, James H Huddleson for four years to fill unexpired term of C Burns Craig deceased Leon H Cornwall for five years

SECTION OF HISTORICAL AND CULTURAL MEDICINE—May 13

- I EXECUTIVE SESSION—*a* Reading of the minutes, *b* Election of Section Officers and member of the Advisory Committee For Chairman Jerome P Webster For Secretary Reginald Burbank For member of the Advisory Committee, Allen O Whipple
- II PAPERS OF THE EVENING—*a* Franz Cornelius Donders, Dutch Physiologist and Ophthalmologist Raymond L Pfeiffer (by invitation), Discussion Ralph Lloyd *b* How old the new James J Walsh, Discussion David Riesman (by invitation)

SECTION OF PEDIATRICS—May 14

CASE DEMONSTRATIONS from 7 45 to 8 30

- I EXECUTIVE SESSION—Election of Section Officers and member of Advisory Committee For Chairman Alexander T Martin For Secretary Philip M Stimson For member of Advisory Committee, Bela Schick
- II PRESENTATION OF SINGLE CASE REPORTS—*a* Babies Hospital—A case of lymphepithelioma of the nasopharynx Alfred G Langmann *b* Bellevue Hospital—Autovaccination productive of generalized vaccinia in an eczematous infant and the mother Charles H Smith Cordelia K Dowman (by invitation), *c* Bellevue Hospital (Children's Psychiatric Service)—A case of osteopetrosis (Marble Bones) Herman Wortis (by invitation) *d* Israel Zion Hospital, Brooklyn—A case of prolonged hyperpyrexia Harry M Greenwald *e* Jewish Hospital, Brooklyn—A case of bronchiogenic carcinoma in a boy of ten years Abram Kanof (by invitation), *f* Lenox Hill Hospital—A case of fatal trichinosis after a clinical course of four days Irwin P Sobel, *g* Morrisania City Hospital—A case of severe lipemia (with lipemia retinalis) in a child with diabetes mellitus Daniel J Dolan (by invitation) *h* Mount Sinai Hospital—A case of multiple idiopathic hemorrhagic sarcoma of Kaposi in a five year old boy, Bernard S Denzer *i* New York Hospital—A case of verrucous endocarditis in a child Edmund N Joyner III (by invitation) *j* New York Infirmary for Women and Children—A case of an infant with Klippel Feil syndrome Clementina J Paolone Kate Constable (by invitation) *k* Polyclinic Hospital—A case of hysterical paraplegia originated by a chronic sinusitis in an eleven year old girl Benjamin R Roman (by invitation) *l* Post Graduate Hospital—A case of primary eclimococcus cyst of the lungs Charles J Leslie (by invitation) *m* St Luke's Hospital—A case of sinus bradycardia Gertrude H B Nicolson (by invitation) *n* St Vincent's Hospital—A case of lipomatosis in insulin injected areas in a boy with diabetes mellitus George B Bader (by invitation) *o* Willard Parker Hospital—A case demonstrating the Arthus phenomenon, Jerome L Kolin

SECTION OF ORTHOPEDIC SURGERY—May 15

- I EXECUTIVE SESSION—*a* Reading of the minutes *b* Election of Section Officers and member of Advisory Committee For Chairman Nicholas S Ransohoff For Secretary Earl E Van Derwerker For member of Advisory Committee Walker E Swift
- II PAPERS OF THE EVENING—*a* New type of splint for immobilization of clavicle fractures Nathan Rachlin (by invitation) *b* Operative treatment of clavus Walter I Galland *c* A new device for compression fixation of fracture of the neck of the femur Robert K Lippman *d* Traumatic coccygodynia George Duncan (by invitation)
- III GENERAL DISCUSSION

SECTION OF OPHTHALMOLOGY—May 18

- Instructorial Hour* 7 00 8 00 p m—Some plastic procedures illustrated by moving pictures Wendell L Hughes
- Slit Lamp—Demonstration of Cases*—Milton L Berliner Girolamo Bonaccalto Gordon M Bruce Wendell L Hughes
- Exhibit on Comparative Anatomy of the Eye* 7 30 8 30 p m—Edward B Gresser

REGULAR PROGRAM

- I EXECUTIVE SESSION—*a* Reading of the minutes *b* Reading of resolutions on death of H H Tyson George Huston Bell *c* Election of Officers and member of Advisory Committee For Chairman John H Dunnington For Secretary Le Grand H Hardy For member of Advisory Committee Lewis W Crigler Demonstration of instrument—An anti glare frame Charles Littwin
- II REPORT OF CASES—*a* Bilateral cataracts with acute secondary glaucoma following the use of alpha dinitrophenol Olga L Sitchevska (by invitation) *b* Cyclic ocular motor paralysis David T Bishop Brooklyn (by invitation) *c* 1 Complete removal of the lower lid for epithelioma with plastic repair 2 Partial removal of the lower lid with plastic repair for basal cell carcinoma Wendell L Hughes
- III PAPER OF THE EVENING—Some clinical studies on the ocular signs of intracranial sinus thrombosis Frank B Walsh Baltimore (by invitation) Discussion Thomas H Johnson R Townley Paton

SECTION OF MEDICINE—May 19

House Officer and Resident Program

- I EXECUTIVE SESSION—Election of Section Officers and member of Advisory Committee For Chairman Clarence E de La Chapelle For Secretary Joseph Hach For member of Advisory Committee Albert R Lamb
- II PAPERS OF THE EVENING—*a* A case of lead poisoning Einar Gustafson Lenox Hill Hospital (by invitation) (15 minutes) Discussion Armin St George (5 minutes) Paul Reznikoff *b* Two cases of coronary thrombosis in young men lead exposure as a possible etiological factor Brandt F Steele Second Medical Division (Cornell) Bellevue Hospital (by invitation) (15 minutes) Discussion Henry J Spencer (5 minutes) Paul Reznikoff Herman O Mosenthal Clarence E de La Chapelle *c* Coarctation of the aorta (adult type) clinical and experimental studies James Flewner New York Post Graduate Medical School and Hospital (by invitation) (15 minutes) Discussion Herman O Mosenthal (5 minutes) *d* A case of pericarditis with effusion John L Caughey Presbyterian Hospital (by invitation) (15 minutes) Discussion Dickinson W Richards Jr (by invitation) (5 minutes) *e* A case of constrictive pericarditis illustrating Pick's syndrome Herman Tarnower First Medical Division Bellevue Hospital (by invitation) (15 minutes) Discussion I Ogden Woodruff (5 minutes) *f* Panmyelosis in the course of polycythemia vera M F Steinberg Mount Sinai Hospital (by invitation) (15 minutes) Discussion S S Oppenheimer (5 minutes) *g* Rosenthal *h* A case of scurvy in an adult with studies on the ascorbic acid content of urine Abraham G Cohen Beth Israel Hospital (by invitation) (15 minutes) Discussion I W Held (5 minutes)

SECTION OF OTOLARYNGOLOGY—May 20

- I EXECUTIVE SESSION—*a* Reading of the minutes *b* Election of Section Officers and member of Advisory Committee For Chairman Edmund Prince Fowler For Secretary Charles W Depping, For member of Advisory Committee Westley M Hunt
- II PRESENTATION OF MEMORIAL FOR ARTHUR B DUEL—By John B Rae (by invitation)
- III PRESENTATION OF CASES—*a* Interesting cases of lateral sinus thrombosis Henry M Scheer *b* Interlobar abscess probed and drained through the cribiform plate, J Ivimey Dowling
- IV PAPERS OF THE EVENING—*a* Milk injections for pharyngeal and laryngeal infections Ward C Denison *b* Foreign bodies in the pharyngeal wall with special reference to localization Isaac M Heller Discussion Ramsay Spillman *c* 20 years experience with iodine powder (Sultzberger) in the conservative treatment of oral and nasal suppuration M D Lederman Discussion H M Scheer M J Mandelbaum *d* Recent advances in the hearing sensation John Guttman

SECTION OF OBSTETRICS AND GYNECOLOGY—May 26

- I EXECUTIVE SESSION—Election of Section Officers and member of Advisory Committee For Chairman Arthur M Reich For Secretary Thomas E Lavell, For member of Advisory Committee Francis W Sovak
- II REPORT OF CASE—Ruptured uterus—peritonitis and recovery, Ralph L Barrett
- III PAPERS OF THE EVENING—*a* Spontaneous rupture of the pregnant uterus Abbey D Seley Brooklyn (by invitation) Discussion opened by Ralph A Hurd *b* The treatment of placenta previa Locke L Mackenzie, Discussion opened by Hervey C Williamson *c* Some aspects of ovulation and menstruation as revealed by nine hundred endometrial biopsies John Rock Boston Assistant in Gynecology Harvard Medical School (by invitation) Discussion opened by Raphael Kurzrok Samuel A Wolfe Brooklyn (by invitation)
- IV GENERAL DISCUSSION

SECTION OF GENITO URINARY SURGERY

The following were elected at the April meeting of the Section Chairman Roy B Henline Secretary Fedor L Senger Member of Advisory Committee Augustus Harris
There was no May meeting of this Section

AFFILIATED SOCIETIES

NEW YORK ROENTGEN SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE

May 18

- I PAPER OF THE EVENING—Accessibility of tumors to radiation therapy with respect to their derivation Charles F Geschickter Baltimore (by invitation)
- II DISCUSSION—To be opened by Francis Carter Wood (by invitation) William Harris Ira Kaplan Maurice Lenz
- III EXECUTIVE SESSION

NEW YORK MEETING OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
AT THE NEW YORK ACADEMY OF MEDICINE—May 20

- I Blood amylase response to acetyl betamethylcholine chloride in rabbits, A Schiffrin L Tuchman W Antopol (Introduced by H Sobotka)
- II Arrest of convulsions of experimental origin by acetylcholine in the cat, H C Coombs O M Cope
- III Effect of tannic acid on intranasal infection with pneumococci H R Cox G Rake
- IV Concentration and purification of gonadotropic substance in urine of ovariectomized and post menopausal women L Levin, H H Tyndale (Introduced by P E Smith)
- V Fat metabolism hormone and hyperglycemia B Harrow, A Mazur I M Chame lin A Lesuk

- VI Inhibitory effect by hypophysis of rats following injections of pregnant mare serum hormone C Hamburger (Introduced by E T Engle)
- VII A new rapid method for direct typing of pneumococcus in sputum of pneumonia cases S J Klein G Heller (Introduced by F P Gay)
- VIII Some properties of Castle's intrinsic factor C Flood R West

NEW YORK PATHOLOGICAL SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE
May 28

- I CASE REPORTS—*a* Hodgkin's disease involving the stomach with fatal hemorrhage Julius Redish (by invitation) *b* Histology of homoplastic suprarenal transplant surviving for eight months in a case of Addison's disease Frederick A Hemsath (by invitation)
- II PAPERS OF THE EVENING—*a* Hereditary early death in localized neurones with resulting paralysis in dogs Charles R Stockard (by invitation) *b* Hemorrhagic extravasations into valvular leaflets and their relationship to pulmonary embolism Eugene Clark Adolph Berger (by invitation)
- III EXECUTIVE SESSION

DEATH OF FELLOW OF THE ACADEMY

RANDOLPH, JOHN MONTGOMERY, M D, 131 Main Street, Rahway, New Jersey, graduated in medicine from New York University College of Medicine in 1886, elected a Fellow of the Academy March 4, 1909, died May 17, 1936. Dr Randolph was attending surgeon to the Rahway Memorial Hospital for many years and was for forty years physician for the Pennsylvania Railroad.



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The Hermann Michael Biggs Memorial Lecture on THE EUGENIC OUTLOOK IN PREVENTIVE MEDICINE*

THE RT HON LORD HORDER, K C V O, M D, F R C P
Consulting Physician, St Bartholomew Hospital
London, England

I am greatly honored, Mr President, by the invitation of the Committee on Public Health Relations of The New York Academy of Medicine, and conveyed so kindly through you, to deliver the Hermann Biggs Memorial Lecture. I hesitated in my acceptance, partly because I was doubtful if I could present you with any topic which might reasonably be called a phase of public health, and partly because I was uncertain if I could maintain the high level of those who have preceded me in this Lectureship, and so do justice to the memory of the distinguished man in whose honor we are met together.

Hermann Biggs' contributions to public health were, as most of you know, epoch-making in their importance. I may perhaps be forgiven if I repeat the short summary of his main achievements, as recorded by Dr Parran in his lecture last year "the introduction" (into this country) "of diphtheria antitoxin, the use of the laboratory as the spear-head of the public health movement, the first requirement that tuberculosis be reported and the administrative control of the disease, the campaign for public education concerning tuberculosis, later expanded to include all phases of public health, the pioneer efforts to reduce infant mortality, the first municipal effort to control venereal

* Delivered before The New York Academy of Medicine, May 7, 1936, under the auspices of the Committee on Public Health Relations

diseases", and a comprehensive "New York health center program" Truly, a formidable list of contributions to human welfare made by one man And when we add "the inspiration of his teaching and leadership," and the fact that he "combined the qualities of a great clinician" with these other gifts, Hermann Biggs is clearly an outstanding figure in the history of medicine and a name deserving of the greatest honor

As has been the case with not a few leaders in sociological progress who have been possessed of dynamic personalities, Biggs was to some extent a disappointed man at the end, because his main project had not been brought to completion But those who are able to take a dispassionate survey of the present state of the health services in New York City know how potent was the influence which Biggs exercised, and how sound was the foundation which he helped to lay The complete solution of the problems which he set himself has not yet been found But by a frank and intelligent co operation between organized medicine and the public authorities the solution is only a matter of time If I may borrow a simile from my own country, St Paul's Cathedral is not even yet finished as it was originally designed by the master mind of Christopher Wren But it is no less glorious a monument to his genius

Various aspects of the Common Health have been presented to you by my distinguished predecessors in this office During the decade since this Lectureship was founded men as well known as S Lyle Cummins, Park, Kiause, Bigelow, Stokes and Mosenthal have stood where I stand this evening, each presenting the aspect of preventive medicine to which he has given years of study and thought and to which he has made contributions of great value Small wonder that I hesitated to accept the Academy's invitation, Sir, when faced with this roll of Hermann Biggs' lecturers until now But, as I say, my hesitation was not lessened by the thought that the outlook upon preventive medicine which I felt constrained to offer you might not be regarded as a legitimate contribution to this important subject

For I am making bold to present this evening an entirely different aspect of Public Health from any of those that have been given in previous lectures. By some, it may not even be regarded as an aspect of this matter at all, by others it may be considered an aspect which has little or no corresponding practical issues. And yet I, personally, am convinced of its importance, nay of its urgency. And I feel sure that I shall not be judged on either of these grounds without a patient hearing, and that is all that any one of us has a right to ask or to expect. I propose to present the eugenic outlook on the common health, and to beg that you will give it your thoughtful consideration.

I must in the first place define my terms.

The definition of Eugenics handed down to us by Francis Galton, who himself coined the word fifty years ago, is "the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally." Galton's aim was ambitious, so ambitious, indeed, that his outlook has been regarded by most people as that of a visionary. 'Change the race' (they say). Why, that is surely a fantastic idea, savoring of the Utopias of old. "It is too high, I cannot attain unto it." And quite apart from that sympathy which most of us have with the Irishman who asked "What has posterity done for me?" we are in the main confirmed optimists. Surely our own mental and physical salvation is a sufficient objective (we plead), without considering future generations? To say nothing of the shocks and long pauses introduced into a single generation by wars and economic hold ups, and the energy needed for their adjustment.

The fact that there exist societies and organizations galore whose activities are concerned with human betterment in our day bears witness to that urge that is inherent in many of us to do something to help our fellows. Whether, and to what degree, this altruism springs from biological incentives, and is really an expression of the ego in sublimated form, as the psychologists tell us, need not concern me in this connection. It is sufficient to note that there

is a large body of good intention, backed by tradition and culture, and supported by wealth, whether of the individual or of the state, available for social reforms. The question that does concern me at the moment is this—is all this expenditure of good endeavor and of money directed into the channels which are calculated to produce the most fundamental, and the most enduring, benefits? Long observation and reflection have convinced me that they are not. This does not mean that schemes for social reform are intrinsically unhelpful, still less does it mean that they should not be encouraged. All it means is that, in the view of the eugenist—a view which I share with utter conviction—the economic advantages, using the term in its widest sense, lie with efforts made towards racial betterment rather than with social service in a particular generation.

Since the outlook between attempts at improving the environment of the people, and attempts at improving the stock, are entirely different, there can really be no conflict between social reform and eugenics. Our attitude towards those critics who suggest such a conflict is to say "These things ye ought to do, but not to have left the others undone." The psychology of the position must be faced, and those of us who feel impelled thereto must contest it. What cramps our style again and again is the lure of immediate results. It is a weak strain in human nature. With the communist it takes the form of a lust for direct action, "and damn the consequences." With the politicians it is "nine pence for sixpence—and I hope no one will notice the slight economic fallacy involved." With the sick man it is the bottle of medicine or an operation. But what, in the main, are all these things save expedients of the moment, temporary devices that can only secure transitory and impermanent results? Too often, alas! they are tricks of the charlatan, whose sole motive is to be the chief actor upon the stage, at their best they must be repeated again and again, and generation after generation, in order to keep the social fabric from falling. Though the eugenist has no sort of quarrel with the principle underlying social and environmental reforms when these are wisely conceived and

efficiently carried out, he is bound to notice that a number of efforts in these directions seem to be of the nature of tinkering. And since all such efforts mean expenditure of energy and money, he naturally regards these as being largely wasted by comparison with the furthering of his own aims. He considers that it is more important to see to it that the material upon which he spends his altruism is the best material possible than to be merely lavish in his expenditure.

Time does not allow me the digression which would be entailed by pursuing this point of view. Suffice it to say that the eugenist is more humanist than humanitarian in his outlook and in his work. He does not believe that permanent results will accrue from pampering the individual or from trying to lead his life for him. He believes rather that it is a divine prerogative for every individual that he should live his own life, and that for others to abrogate this privilege is to do him a great disservice. On the other hand, he believes that to do his utmost to start every new life on as sound and sturdy a basis as possible is the greatest service that one human being can render to another. Such is the Eugenist's creed.

If I may for a moment deal with the national stocktaking of life today—I speak of conditions in Great Britain—I find these somewhat disturbing facts. For years every child has been educated, the clever, the strong, the blind, the dull, and the feeble-minded. For twenty years we have had National Health Insurance, and the number of Maternity and Child Welfare Centres has greatly increased. Much money has been spent on the needy, on housing and on a number of other things. Our bill for social services in England and Wales (only), with a population of some 40 million souls, during 1930, amounted to £407,545,000, or over 2,000 million dollars. In spite of this, it has been estimated that today one person out of ten is too dull or unhealthy to be absorbed into industry, one in 120 is mentally defective, one in 300 is *certified* as insane, and a large number in addition to this are *uncertified*.

What is wrong? I believe the answer to be that we have forgotten heredity, and we have forgotten that if heredity does not work for us it works against us. We have concentrated upon nurture and we have neglected nature. In Medicine it is of interest to note that we have tended to get back farther and farther in our outlook and in our practice. From the mere cure of the individual patient we have turned our attention to the control of the disease and the increase of the patient's resistance to disease. We call this preventive medicine, and we are all of us convinced of the wisdom of this orientation in medical science. Then again, we have attended more and more to the child and from the child we have turned our attention to the infant and we have gone back still further, even to prenatal life. But we must go back further still, for by the time the new individual is conceived heredity has already stamped upon it, either the power to live healthily or handicaps from which, lavish our care upon it as we may, it may never be able to shake itself free. Eugenics, in actual fact, if we take the long view and not the short one, is the soundest and by far the most profitable form of preventive medicine. This, as I indicated in my opening remarks, is my thesis.

To some here this evening all this may seem like beating a willing horse. They must forgive me my emphasis, because they must remember the lag that exists in the minds of many others on this matter. There is (1) first of all, the attitude of the determinists amongst us—those who say, "Why interfere with nature? She will see us through all right. And, anyway, does not evolution arrange these things over our heads?" Granted the vital forces of nature and of evolutionary tendencies, these forces can themselves, we have reasons for believing, be brought under control. But though we all agree in striving to get control of things and forces which are physical and chemical, we boggle at the idea of getting control over things and forces which are biological. Why do we? I can think of no reason save a deep seated prejudice, which no doubt has its roots in the dim and distant past, when a new individual was thought to be a direct gift, or burden—as the case may be—from the

god of the race or of the tribe. That it is the product of two individuals, that it inherits physical, mental and even temperamental characteristics from those two individuals, and that these can to some extent be modified at will, is knowledge of comparatively recent origin.

I suggest that civilization has advanced far enough to encourage us to achieve biological control just as actively as we seek to achieve physical control. I go further, and suggest that efforts at achieving biological control are already overdue. Biological control in the human sphere, I mean, since no one seems to question either the wisdom, or the morality, of achieving biological control in the animal and in the plant worlds. We accept the principle in relation to our horses, our cattle, our dogs, our corn and our cabbages. But we gasp at the idea of accepting the principle in respect of men and women.

(ii) Then, again, there is opposition from a particular section of the Church. The principle of attempting biological control offends the religious emotions and ideas of some of us. I do not propose to enter this particular arena, although I am constrained to admit, however reluctantly, that the particular aspect of public health for which I am pleading today is becoming more and more a religious issue. The degree to which a man's religion determines his views on questions of the kind I am discussing tonight must be settled in the sanctity of his own secret heart. Nor shall I do more than remind myself of the golden rule, and that it is quite as applicable in the eugenic field as in the field of the environmentalist.

(iii) Then there are some critics who say that we have not as yet enough knowledge upon which to put eugenic principles into action. My answer to this is to admit in the first place that our present knowledge of genetics, that is, of the laws governing human heredity, is certainly meagre. But I advance in the second place that until more observation and research are undertaken in respect of these laws we shall remain ignorant. We cannot employ the same methods in the study of genetics in the human race as we can with domestic animals and with plants. And

the characteristics to be observed are vastly more complex. But we know enough to feel sure that there is a mass of unascertained facts that would prove of enormous value if we had them, and we have definite reasons for believing that the basic laws which we know to operate in plants and in animals operate also in human beings. In other words, it is highly probable that, if we chose to do so, we could go a long way towards encouraging dominant characteristics that make for physical and mental health in men and women and discouraging characteristics that spell physical and mental ill-health.

But suppose my thesis that the eugenic outlook is an important aspect of preventive medicine be accepted, and it be desired to pursue the principle into practice, what can be done?

1 In the first place the study of genetics should find a place in the universities and schools, and should be encouraged by the foundation of scholarships and research studentships.

2 Genetics should be taught to medical students. We are told, and we know by our own experience, that the medical curriculum is already too full. But room should be made, and could easily be made, in the preclinical subjects (e.g. physiology) by the omission of something which is far less important.

3 The compilation of family pedigrees should be encouraged. These have a value for the individuals who compile them over and above their value to the seeker after genetic information. The Eugenics Society of London has prepared a schedule which is very useful in this connection, and which makes the filling in of the particulars comparatively simple.

4 Health examinations before marriage should be encouraged. In my judgment such examinations should be voluntary. In certain countries—Germany is one—pre-nuptial examinations are obligatory, and people are not allowed to get married unless the results of these examinations have proved that they are fit. The great objection to compulsory pre-nuptial examinations is the ease with

which persons who resented examination could conceal or distort important facts. A simple form of premarital schedule has been issued by the Eugenics Society, and has already been in considerable demand. It has received the blessing of the Ministry of Health in Great Britain, and of the medical press also. A healthy sign of the times is the increasing number of persons who consult their doctors prior to marriage. Such consultations should be encouraged. A man and a woman should be proud of being found fit for parenthood.

5 But anyone should be proud of being fit and of keeping fit. The maxim "know thyself" is very ancient but few of us put it into practice. It takes a war to stimulate most governments to carry out a national stocktaking in regard to the physique and mental health of its citizens. And I am ashamed to say that some of them regard the omission of the census as a form of economy in times that are stringent. Surely the more stringent the times the more need for careful stocktaking. What should we think of a shopkeeper who adopted methods like these? It should be possible for men and women, especially those of marriageable age, to produce, if not a pedigree, then at least a statement, kept up to date, of their physical and mental fitness. Here, again, would be engendered a legitimate pride in the fact of being a healthy citizen.

6 The positive application of the eugenics principle, however, takes us farther than this. We must do our utmost, by cultivating a family conscience, to counteract the selfishness of the childless marriage when both parents are healthy, and by combating that "tender mindedness" which is so common in these days in women who refuse to brace themselves to fulfil their main function in life.

7 And if the monetary status of the parents is a real, and not merely a selfish, bar against a family, which, if the truth be said, it quite frequently is, we must help them by a proper scheme of family allowances, whether by the remission of taxes or by even more direct assistance. In most civilized countries the birth-rate is falling. Quite soon the figures may be such as to cause alarm in the minds of

those who have the interest of their nation at heart. The guiding tenet of Galton is based upon qualitative lines, not on quantitative lines. And we dare not sacrifice quality to quantity. But there is no reason why both of these desiderata should not be attained if the principles of eugenics are strictly followed.

So far I have dealt with the practice of the eugenic principle on positive lines. But there is a negative aspect of Eugenics also, and this aspect has attracted a disproportionate amount of attention. It has attracted more attention because it is both easier, and more immediate, in its attainment, is more dramatic in its appeal and because it involves much less self-sacrifice.

8 At the present time there are two practical examples of negative Eugenics. The first of these is sterilization of the unfit. The Eugenics Society in Great Britain is a strong advocate for the legalization of voluntary sterilization, under appropriate safeguards, for persons suffering from, or carrying, transmissible defects which seriously impair physical or mental efficiency. It considers that, without introducing compulsion, valuable results can be achieved by awakening throughout the community an enlightened eugenic conscience. The legal position in regard to sterilization, in Great Britain at all events, is highly unsatisfactory: a doctor who advises, or himself performs, an operation for sterilization has no legal cover. He may be made the subject of an action at law and if the jury should take an adverse view of the matter, he may be mulcted in heavy damages. This is scarcely an encouragement to the doctor. Moreover, the present state of the law in England throws a stigma also upon the patient. There are those who consider that the safeguards proposed hitherto in regard to the proposed Bill are unnecessarily severe and restrictive, there are others who desire to see compulsory sterilization introduced. But the official view of the Eugenics Society is that the greater hope of inculcating a eugenic conscience lies along the path of voluntary, rather than enforced, sterilization.

A great deal of propaganda is still necessary to popularize this measure. Many people do not know that the risk

to life of a sterilizing operation is very small indeed in the female and negligible in the male, that in the latter it can be performed under a local anaesthetic and that in neither sex does it in the least degree impair health or change the sex function, except in the matter of conception

9 The second form of practical negative eugenics is what is termed Birth Control, though the more correct term should be conception or pregnancy control, the words Birth-Control have become too popular to be ousted in favor of the more accurate expression

Time does not allow me to deal fully with the history of this measure of negative eugenics. It is, of course, as old as Bradlaugh and Annie Besant. It has had a chequered career. It has been blessed and it has been cursed. That it has come to stay seems certain, but that there is no method yet known which is free from some disadvantage is equally certain. The disadvantage may be physiological or it may be aesthetic or it may be no more nor less than that the method is unreliable, the fact remains that so far we have not found a method that is anything like perfect. Research is necessary, therefore, and such research is being actively undertaken in several countries. In Great Britain grants are made from the funds of the Eugenics Society to the Investigation Committee of the National Birth Control Association for this purpose.

The British Ministry of Health encourages the teaching of birth control by the municipal authorities through their medical officers of health to married women at special clinics. Originally restricted to women for whom confinement would involve risk of life and to women suffering from serious organic disease, the Ministry memorandum last issued leaves a good deal of discretion to the doctor and may no doubt be read to include women whose state of general health and nutrition would be badly impaired, whether from physical, mental or economic reasons, by further child bearing.

Unfortunately the practice of Birth-Control has tended to act dysgenically rather than eugenically during the past 50 years. This is because its use has been largely confined to persons of superior biological endowment, rather than

by those who have needed most some means whereby the births of their children might be spaced. This spacing of births, it is generally agreed, is the only proper use to which the practice of contraception should be put. The only way to correct this fault of instruction in contraceptive methods not reaching the class for which they are most helpful is to provide it through local authorities under medical supervision in properly organized clinics. But such instruction should not be confined to women whose lives are in danger from subsequent confinements nor to those who are suffering from gynecological diseases. It should, however, invariably be under medical control and supervision.

Need I, in this place, and in the year of our Lord 1936, deal with those critics who advance as an objection to Birth Control that its practice tends to the increase of sex promiscuity? Are we never to grow up? Does anyone still seriously hold that men and women can be made moral agents through fear of contracting disease or of producing illegitimate offspring? And, anyway, shall we penalize women who have due need of help in the legitimate spacing of their childbirths because other folk exist who would find it easier to break through the conventions that society and the sanctity of family life impose upon them, as the result of this knowledge that they steal for their own ends? Surely there can only be one answer to this question.

I have now completed my analysis of the engenic outlook, and I repeat that I hope it may be regarded as having an intimate bearing upon preventive medicine when the long view is taken. And experience, with some thought, has led me to the belief that the long view, in human affairs, is the soundest view. I know that this is the day of direct action, and that, to many, the long view is unpopular. But I am distrustful of quick ways of achieving the millennium and I regard the lust for direct action as being merely a temporary break in the growth of human wisdom. The gist of the matter seems to me to be summed up in the question: are we going to continue to breed, and to support, a race of sub-men, or are we going to encourage the elevation of the race, and thus reduce our commitments in the field of what

we term the social services' I repeat that I believe what the public, or the common, health needs more than anything at this time is that it should be regarded from the viewpoint of Eugenics. I will end my remarks by summarizing the aim of Eugenics as I see it. If I have brought coals to Newcastle I must crave your pardon. If I have not, I am glad of the opportunity of offering some fuel for your mental consumption.

"The aim of Eugenics is to study the laws of heredity as they apply to human beings, with the practical purpose of using this knowledge for improving the physical and mental quality of the race. Eugenists believe that no child should be born into the world who is unlikely to have a fair chance. They affirm, therefore, that anyone, man or woman, who undertakes the serious responsibility of parenthood, must be free from any disease, mental defect, or other disability that is likely to be passed on by heredity and so impair the quality of future generations. Most intelligent people now share this view, indeed, many have too few children, because they wish to give the best care and attention to each child. But the nation is endangered when fit people refuse to have children for selfish reasons. Every country needs the best citizens it can produce.

But if it is agreed that people who are sound in body and mind should have as many children as they can afford to bring up, it follows that people who are ill endowed in body or mind, and whose offspring are liable to be unhealthy or subnormal, should avoid having children. The next generation should be recruited from good stocks rather than from bad. But exactly the opposite is now happening, for it is among the fittest stocks that the birth rate is lowest and among the unfit that it is highest. We should not be content to allow this to continue. We should encourage the fertility of persons likely to produce healthy children, and at the same time prevent the waste and misery caused by the birth of children who are healthy neither in mind nor in body. These policies deserve the serious consideration of every citizen and especially of young people who are entering on adult life and beginning to realize its responsibilities."

Bulkley Lecture

THE IMPROVEMENTS IN THE ABILITY OF THE MEDICAL PROFESSION TO TREAT CANCER

FRANCIS CANTER WOOD, NEW YORK

Dr L Duncan Bulkley was born in 1845 and died July 20, 1928. In his will he bequeathed a fund to the Academy of Medicine to endow an annual lecture on subjects related to malignancy, to be known as the Bulkley Lecture.

The year before Dr Bulkley's birth the New York Pathological Society was founded and the year after, the London Pathological Society. Leukemia was described by Bennet and Virchow in the year of his birth. A year later Morton introduced ether anesthesia and in 1847 Simpson discovered the value of chloroform. When Bulkley was thirteen years old Virchow published "Cellular Pathology" containing the first of his investigations on cancer, but it was in 1867, when Dr Bulkley was twenty-two years of age, that Lister began his work on antiseptics.

Without anesthesia and antiseptics the surgical treatment of cancer was impossible. The effects of these, especially of anesthesia, can scarcely be estimated. Notebooks recording the operations done by some of the older surgeons in this country have been examined in recent years and men whose names are immortal in surgical annals did during their active lifetime about one-half as many major operations as are done nowadays by the average intern in a metropolitan hospital in a single year.

The introduction of ether anesthesia took out the horror from surgery but it did not remove the horror of infection. These two things limited surgery closely and even though men like Fabricius described in 1607 the operation of excision of the lymph nodes in carcinoma of the breast and recommended the Willy Meyer method of beginning dissection of nodes in the axilla and extending the excision to the breast, he probably did only a few of these operations for he describes just one.

Delivered before The New York Academy of Medicine, February 14, 1936,
in the Friday Afternoon Lecture Series

Thus Dr Bulkley's lifetime covered more than the whole period of the effective treatment, for cancer was never cured in the early days of surgery

The effective treatment of cancer began with the use of anesthesia I spoke of the horror of surgery without anesthesia The modern weakling complains bitterly of the nausea, headache and vomiting which follow ether anesthesia, but as you all know extraordinary improvements have occurred in our ability to check pain, even in the last ten years These benefits may be enumerated as the removal of the dangerous anesthesia of chloroform, the introduction of rebreathing apparatus, the facilities for using oxygen and carbon dioxide, for short anesthetics with oxygen and nitrous oxide alone, the stimulation of the respiratory center with carbon dioxide, the combinations of sedative drugs with anesthesia, the use of preparations like sodium amytal in combination with other types of anesthesia, the introduction of oil ether rectal anesthesia thus freeing the surgeon from interference in his work on the upper respiratory tract, the discovery of avertin, which has had its mortality but in skilled hands is a valuable addition to our technic, the introduction of ethylene and cyclopropane, and the extraordinary extension of the use of local anesthesia by nerve blocking and the spinal route

In 1905 Roentgen made the discovery which, with that in 1907 of Marie and Pierre Curie, has completely changed the face of experimental physics as well as the curative and palliative treatment of cancer

Lister's discovery was another essential in the effective treatment of cancer The day of infected wounds has passed Gloves, iodine, the physiological handling of tissues, the stopping of hemorrhage, the use of the electric cautery knife in addition to the scalpel have permitted extensive and mutilating operations never before possible War experience has enabled us in many instances to repair mutilations not previously remediable

In diagnosis two things stand out Improved instruments such as the ophthalmoscope, cystoscope, bronchoscope, sigmoidoscope and gastroscope, are coming into

more and more frequent use with the result that early tumors are discovered. More valuable almost than this has been the introduction of x-ray, used directly in the diagnosis of lung tumors, combined with an introduction for the study of the brain neoplasms, lipiodol, and other opaque media, and barium for the gastrointestinal tract. Only those who saw the beginning of such diagnosis in 1899 realize the extraordinary advances.

The classification of tumors began chiefly with Vinchow seventy five years ago. The mere assigning of names to tumors did little, the important thing was the collection of a large material studied in correlation with the history and clinical signs, and the combination studies such as those of the Tumor Registry of the American College of Surgeons, all of which have provided an immense amount of definite knowledge. The grading of tumors has been helpful. Biopsy, with the use of the electric cautery, and the so called punch and aspiration biopsies are now almost universal.

Today the line is more sharply drawn between those tumors which can be operated upon with fair success and those which should be treated with irradiation, and those which are hopeless from any point of view. Fewer unnecessary operations are being done. The technic of the removal of tumors from various situations has been codified so that no one is justified in attempting modifications or changes in the technic, except when some extraordinary circumstance arises. This permits of more rapid operation with a lessened death rate while at the same time the removal of the tumor is satisfactorily accomplished.

Further aids in the treatment of cancer have been the excellent educational campaigns fostered by the American Society for the Control of Cancer and the American College of Surgeons' splendid efforts in improving the education of the physician both in diagnosis and therapy. Post graduate teaching has assumed an important position not only in schools but also among groups of physicians who unite to receive and to give information of use to the man who has no longer contacts with a large material.

These educational efforts are slowly increasing the number of operable patients who apply for treatment

Another improvement is the concentration of cancer material in cancer clinics which are now developing all over the country. The man who sees ten cases of cancer a day is infinitely more competent than the equally intelligent physician who sees ten in a year. As cancer is a transportable disease it is now possible to send patients to a county or state hospital where the treatment is conducted by those who have had wide experience and where there is a large advisory staff for consultation.

Surgery still remains the most effective agent for treating most types of cancer. X-ray and radium have their limitations based upon the insensitiveness of the tumor cells to such irradiation and the impossibility of obtaining a sufficiently intense dose even if the cells are fairly sensitive. Where the cells are accessible and sensitive, as in the basal cell tumors of the skin, irradiation is just as effective as surgery. In the therapy of squamous cell tumors of the skin training is necessary for the average physician is apt to underdose with radiation in order to prevent scarring, and when these tumors recur they are difficult to treat by surgery and impossible for treatment by further radiation.

The cervix is a field where splendid results have been obtained by irradiation, chiefly with radium, showing a 22 per cent rate of cures of all cases presenting themselves. Obviously selected groups show far better figures.

These are the two fields of the ordinary types of malignancy in which it is justifiable to use radiation instead of surgery.

Another is in the borderline types of neoplasms, such as the lymphoblastomas, which because they are so frequently multiple are better handled by palliative irradiation than by surgical removal. But radium does not cure leukemia, Hodgkin's disease or lymphosarcoma, though of the latter there are a few recorded cures possibly due to incorrect diagnosis.

The introduction of the prolonged treatment with x ray as developed by Regaud and Contard is bringing under the control of radiation many tumors of the upper respira-

tory tract which hitherto have been hopeless. The application of this technic to abdominal tumors, especially in advanced cases of carcinoma of the uterus, seems promising, but the technic is time consuming and the necessary high dosage is dangerous.

Two recent phases are of great interest. One is the use of extremely high voltages up to 1000 kv, and the other the reintroduction of the early type of therapy by Chaoul with special apparatus for administering low voltage x ray into the cavities of the body. Both of these technics are still under trial and it may be many years before final conclusions as to their value are reached.

What are the results? In the hospitals receiving an intelligent class of patients 70 per cent are inoperable on admission and can only receive palliative treatment from x-ray or radium. In hospitals receiving the less intelligent class, such as the great city institutions, the operability is little over 10 per cent, and it is fortunate if a five-year salvage of 5 per cent of the total admissions is obtained. These patients present neglected cancers or cancers which have been treated by medicinal means by the lower grade practitioner.

With the more intelligent material it is probable that a 20 per cent five-year salvage is the limit at present, with 30 per cent as an ideal, but it must be remembered that these figures are obtained from a limited group of types. For example, cancer of the skin, lip, breast, cervix and rectum. The internal forms, such as brain, lung, stomach, pancreas, adrenal, kidney, do not contribute many cures. Nor is there any evidence that improvements in surgical technic or improvements in radiation technic will give very much more favorable results. Nor can education be pushed beyond a certain point. It is absurd to think that we will ever be able to diagnose in the incipient stages many of the internal neoplasms.

Attempts to obtain various types of serum reactions have not been satisfactory, either the process is so complicated that it can be done by only a few experts, or the percentage of error is high. Nor at the present moment is there any

hope of a serum for medicinal treatment from the research point of view. Animal experiments have clarified much of our knowledge concerning human cancer and have added many new facts, but these facts only reveal the impermeability of the cloud which hangs about the problem.

Apart from all attempts to cure cancer, a large field is rapidly developing in which palliation and prolongation of life replace the attempt to cure.

Palliative surgery of the type of colostomy or gastroenterostomy for malignant growths of the rectum or stomach or gastrostomy to relieve the starvation incident to obstruction of the esophagus by a carcinoma is well known. Other types of surgical palliation include chordotomy for the relief of intractable pain or the injection of alcohol into the nerve tracts or centers to produce a temporary interference with the transmission of pain to the central nervous system.

But aside from this there has also developed a field of palliation by means of x-ray. The most notable form of this phase of therapy is the relief of pain from bone metastases, especially those following carcinoma of the breast. The spine, the pelvis and the long bones are frequently involved in this type. In many instances the suitable application of very moderate amounts of radiation will relieve the patients' pain completely and often render them capable of doing a considerable amount of work or even wholly returning to their normal activities. This palliation may last for a year or in unusual instances two or three years, rarely longer. Into this group fall the treatment of Hodgkin's disease, leukemia and lymphosarcoma. It is sometimes possible to keep a case of chronic lymphatic leukemia or even myelogenous leukemia alive for many years and in great comfort. Hodgkin's also may be palliated and a number of cases are now on record in which the disease has remained wholly quiescent for eight to ten years. The large follicle type of lymphosarcoma described by Baehi and Klemperer is amenable to therapy and the patients often live five or six years without serious discomfort. Ultimately of course the disease extends and

becomes radio resistant so that no further treatment is of value

Primary bone tumors of certain types can be well palliated, for example, the so-called Ewing tumor or reticulo sarcoma of bone, certain other of the less malignant types of bone tumors and occasionally a true osteogenic sarcoma may benefit by heavy radiation even though there is no marked arrest of the growth

Many of the extensive and neglected cancers of the skin may be relieved and the whole course of the growth occasionally checked by suitable prolonged radiation of the type recommended by Coutard, but the treatment need not be kept up for the same period that it would be in the case of an attempt to produce a cure. This is impossible in the late recurrent, repeatedly treated types of skin carcinoma

Considerable progress has been made in treating abdominal recurrences or extensions from ovarian carcinomata. These vary greatly in their malignancy and in some cases it is possible to produce a permanent cure. In some types no benefit is obtained from any amount of radiation. An intermediate group exists in which palliation may be obtained for a number of years, the ascites checked, the edema of the lower extremities relieved by causing absorption of the tumor so that pressure is taken off the pelvic vessel and on occasion these patients may be kept comfortable for some years even though finally the growth progresses

In carcinoma of the rectum, prostate and bladder a certain amount of palliation is often possible

The stenosis from a carcinoma of the esophagus may be relieved so that the patient can swallow food but life is scarcely prolonged beyond a year

There is still another field in which a good deal of improvement has taken place over what was available ten years ago. The introduction of the synthetic sedative drugs of various types have proved extremely useful in relieving the pain of carcinoma. The barbiturates are useful as sedatives and combinations can be made between aspirin, pyramidon and codem, for example, which will keep the

patient in fair comfort for a period of time and avoid the use of heavy doses of morphine or similar drugs for the terminal stage of the disease

In other words the last twenty years has seen an enormous improvement in the handling of the hopeless cancer patient, making him much more comfortable and rendering a cancer death no more terrifying than that from a cardiac or renal lesion

This covers our survey. The fact that cancer is curable has been demonstrated in a most dramatic fashion of late by the collection of some 25,000 cases of five-year cures from the records of the members of the American College of Surgeons. There is no doubt that these records may be duplicated in equal numbers in Europe. It will be noticed, however, in reading the records that most of these cases are of certain types, chiefly the accessible neoplasms. The occasional miraculous cures of the internal group that are reported may never again be repeated. As has been said, on the average 70 per cent of the persons with cancer who enter a general hospital are already impossible of cure. With the modern techniques in well equipped institutions, probably 20 per cent of those who are operable are cured. Unless education shortens the period of delay between the beginning of the tumor and the entrusting of the patient to those who can treat him, the results will not exceed 30 per cent of all those applying at the door of the hospital. Many of the rest can be effectively palliated, but their lives will not be long.

If this picture seems to be a sad one and a criticism of the effective ability of the profession, there are three things which may bring some comfort. One is that the quacks never cure cancer, the second is that fifty years ago the number of cures even by the medical profession was infinitesimal, and thirdly the possibility of an effective palliation of the disease in those otherwise hopeless has been enormously increased by the proper use of radiation. Most of the real progress in tumor therapy has been made in the last twenty years. Rather than a sad picture then let us look upon it as a splendid attack upon an implacable enemy of the race.

ROLE OF THE NESTORIANS AS THE CONNECTING LINK BETWEEN GREEK AND ARABIC MEDICINE*

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This paper deals with a period of history which is rather difficult to define, for its study includes the last part of the ancient period and the early centuries of the Middle Ages. Even from the point of view of Mediterranean culture it is difficult to say when ancient thought ended and medieval thought began. If the Fathers of the Church ushered in the medieval period and ended pagan civilization, their chief accomplishment, considered from the standpoint of science and world culture, lay in the fact that they created a new contact between Greek and Oriental thought. It is important to conceive of Ancient Civilization, the Middle Ages and Renaissance as not exclusive but as overlapping. Certainly in the period of history under consideration antiquity merges by imperceptible gradations into the Middle Ages.

In many students of medical history and medical science the mention of the Middle or Dark Ages creates a feeling of disinterest, if not antagonism. The term Dark Ages implies a period of regression, a time of endless controversy, the fruitless arguments of Scholasticism. If one admires—and who does not—that marvelous bloom of Greek art, science and culture in the short period of the sixth to the fourth centuries before the Christian Era, well termed the "Greek Miracle," one cannot but be intrigued by the question of how Greek culture, which so nearly perished, was transmitted through the Dark Ages to renaissance Europe. As Sarton¹ so clearly states in his Introduction to the History of Science

"From the point of view of the history of science transmission is as essential as discovery. If the results of

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Ptolemy's investigations [in astronomy] had been hidden instead of published, or if they had been lost in transit, they would be almost as if they had never been

If there were no other reason to study medieval science than to find out how ancient knowledge was handed down to us, that reason would be sufficient. The average man of science, perhaps lacking in historical training, cannot imagine the complexity of the problems involved. The transmission of modern science is almost automatic, a discovery published in any scientific journal is within a relatively short time quoted and discussed in a number of other papers which circulate all over the world. Any scientist, working along the same line, is bound to hear of it, either directly or indirectly, and in the latter case he will have no difficulty in obtaining a copy of the original text. A hundred agencies have solved the problem of transmission so completely that the individual scientist does not think of it any more. In the Middle Ages these agencies did not exist, publication in manuscript form was necessarily very limited, and it could never be standardized. Moreover, political vicissitudes caused innumerable difficulties. Some discoveries had to cross in slow stages the whole of Asia and Europe before reaching the West and being integrated into the main scientific current which has come down to us. Some writings had to be translated many times before reaching their final assimilation, thus many Greek texts became a part of our intellectual patrimony only after having been translated from Greek to Syriac, from Syriac to Arabic, then into Latin, and finally into our own language. These translations were imperfect, and in the case of important works, seldom unique, thus occurred conflicting traditions which caused new difficulties.

It does not matter whether we like mediaeval science or not, the fact remains that we cannot arbitrarily neglect it, if we would understand the continuity of human progress. Even if mediaeval scientists had not made any original contributions we should still be obliged to study their activity, else it would be impossible to explain the origin of our present knowledge. Whatever we learned from the

ancients could not be taught us directly, it could only reach us by some continuous traditions which it is our duty to ferret out."

So to students of medical history there are now available many brief, more or less accurate accounts of how Greek science and Greek culture were transmitted through the Mesopotamian schools, especially those of Edessa and Gondisapor, in the translations from the Greek into Syriac or Aramaic, and from the Syriac into Arabic, by the rather small, unorthodox Christian sect of Nestorians who dominated these Mesopotamian schools during the third to the seventh centuries of the Christian era. But the mere recording of how Greek culture and Greek medicine was transmitted by the Nestorians to the Arabic conquerors does not tell why this Christian community of Semitic race was the transmitting medium. It is the *why* rather than the *how* which has interested the writer. In this paper an attempt will be made to analyze the several factors that resulted in the Nestorians playing this rôle of the connecting link between Greek and Arabic medicine.

Who were the Nestorians and their ancestors? Where did they live? What were the political and economic factors in the history of that time that molded them and determined their course? How was their national character influenced by the religion and philosophy of the period? These are some of the questions that naturally come to mind. Their answers will very largely explain the *why* of the title of this communication.

Exact knowledge of the origin of the Nestorians is lacking. In all probability their ancestors were a Semitic race, known as the Aramaeans, which migrated north from the Arabian peninsula into what is now spoken of as Syria, and spread eastward into what the Greeks later called Mesopotamia. The Arab chroniclers referred to them as the Nabateans. I am indebted to Professor Hitti of Princeton University for the data regarding the probable origin of the Nestorians. (Map I.)

For centuries as Aramaeans they had been given to commerce and by their caravans had come in contact with



MAP I—Probable Origin of Aramaeans, with Their Later Growth and Distribution through Mesopotamia, Khurdistan and Persia (From Breasted's 'Maps of Ancient Civilization')

countries north, south, east and west of Mesopotamia Conquered by the forces of Alexander they remained under Greek control until the Seleucidae, torn by internal strife and political intrigue, gave up the defense of their Mesopotamian possessions There then arose small kingdoms or principalities in northern Mesopotamia, among them Osrhoene and Adiabene The small kingdom of Osrhoene is of special interest to our subject, for it was in this principality that we first hear of Edessa, its capital History² fairly definitely assigns the founding or rebuilding of Edessa to Seleucus Nicator in 304 B C After the withdrawal of the Seleucidae, Edessa was the capital of Osrhoene under the rule of a line of kings of a mixed race of Nabatean, Armenian and Parthian origin Barhebraeus³, speaking of these people, says "Parthian, Persian, Edessan and Armenian are all one"

The chronicle and chronology of the Osrhoene kings are based upon a single MS in the Vatican, known as the "Chronicle of Dionysios of Tell-Mahre" written in 776 A D and translated by Assemani in his "Bibliotheca Orientalis" This was retranslated by Noeldeke⁴ and this revised and corrected Chronicle is given in its relation to Edessan literature and theology by Duval⁵ in his "Histoire d'Edesse"

Edessa is the Greek name for what was called by the Assyrians Ourhai, by the Arabs Ar-Ruha, and today still exists under Turkish rule as the town of Urfa After its founding in the third century B C it remained a pagan town until about the middle of the second century when it is said to have been the first city in Mesopotamia to be Christianized There is a most attractive legend, inaccurate though it be chronologically, connected with the conversion of the city to Christianity Abgar Oukhama, then reigning over Osrhoene, hearing of the miraculous cures of Jesus, sent him a letter asking him to come to Edessa to cure him, the King, of a fatal disease Jesus replied to Abgar

"Thou art fortunate, thou who believest in me, not having seen me For it is written of me that those who see me do not believe in me, but those who do not see me, believe in

me As to your asking me to come to you, the work for which I was sent is about to be accomplished and I am to return to my Father who sent me After I have ascended to Him I shall send you one of my disciples who will cure your sickness and will convert you and those about you to life eternal The city shall be blessed and no enemy shall prevail against it "8

This "Legend of Abgar" states that Addai, supposedly one of the seventy apostles, was sent by the disciple Judas Thomas, who healed Abgar and as a result of this miracle and his preaching converted Edessa to Christianity in 32 A D , and built a church from the money which King Abgar gave him

So we find the Assyrians at the beginning of their Christianity a somewhat mixed race living in a land which favored their coming in contact with several of the great cultures, Greek to the north, Roman to the west, Egyptian or Ptolemaic to the south and Persian to the east Geographically they occupied territory that lay on the main commercial routes between the East and the West, the North and the South

Cathay had certain commodities, especially silk, that the Roman Empire needed and coveted The great silk ways were the result of this supply and demand With the establishment of Roman power in the West and the domination of the Han Dynasty in China this caravan route between the Mediterranean and China emerges into history About the middle of the second century B C there began one of those primeval migrations from the borders of China to the West What the urge was is not known, but the Indo-Scythians, spoken of in Chinese as the Yueh Chih tribe, living in what is now the province of Kansu, left their ancestral home and began swarming to the west and south Within a scant two centuries they had taken over the eastern provinces of what had been Alexander's empire, conquered part of Persia, and had become a threat to Rome When China conquered eastern Turkestan a caravan route was opened between China across the Indo-Scythian kingdom to the Persian and Roman Orient



MAP II—Map of the Second Empire, Showing Sassanian Empire and Great Silk Way from Mediterranean Eastward to China (From Rawlinson's "Seventh Great Oriental Dynasty")

(Map II) Thomas Francis Carter, in his monograph on the "Invention of Printing in China," one of the most scholarly pieces of research of the past decade, discusses the great silk ways, he lists the peach and the apricot, silk and tea, porcelain and paper, playing cards and probably gun powder and the compass as some of China's gifts to the West. The grape and alfalfa, the carrot, glass manufacture, Nestorian Christianity and Mohammedanism, the alphabet and some impulses of Greek art are a few of the things that the countries of the East received in return. Berthold Laufer⁸ states that from the Christian era down to the

Mongol period the knowledge of twenty-four agricultural products passed from China to Persia and westward, and sixty eight from west to east

Silk was probably the most desired Chinese product. It reached Europe sometime before the Christian era, but the process of producing silk was kept a secret until the sixth century. Virgil and other Roman workers considered silk a vegetable product and thought it was combed from trees. It was not until the reign of Justinian in the middle of the sixth century that Nestorian missionaries returning from the Far East reported that silk was not "combed from trees," but was made by caterpillars. At Justinian's instigation these priests journeyed to Khotan in Chinese Turkestan and returned with the precious caterpillar eggs hidden in the long bamboo staff of one of their number. If this story told by Greek chroniclers is true, the culture of the silkworm in Europe and the Near East was started from the eggs carried in the bamboo staff of a Nestorian missionary. This geographical location of the Assyrians and their contacts with the great civilizations comprise the first great factor in the Nestorian's rôle in medicine.

This mention of the Nestorian missionary brings up the subject of the influence of religion and philosophy in the evolution of the Assyrian people, and it is a most important influence. Following the introduction of Christianity the inhabitants of Osroene and Adiabene took a very active part in the early diffusion of Christianity throughout Asia Minor, Egypt and Mesopotamia. They were especially active in collecting and translating the Scriptures, in fact were the first Christian sect to translate the Old Testament from the Hebrew into their own vernacular, the Syriac, in what has ever since been known as the Peshitta version. This was completed about the middle of the second century. The Jews had begun and were still occupied in editing the Talmud. There was a very active argument among these Semitic scholars as to what was and was not the authorized Scripture. Like all true Semites the Assyrians were great respecters of Authority, but there was bitter and constant argument as to what was the ultimate authority. It is

most interesting to note here, because of its bearing on their subsequent familiarity with Greek in relation to medicine, that these Assyrian scholars applied themselves diligently to the study of Greek so that they could read at first hand the Septuagint version of the Old Testament which had been completed in Alexandria in 132 B C. This Greek version was made by a group of about seventy Alexandrian Jews who had forgotten their Aramaic vernacular. It antedated by at least a century the standard Hebrew text of the Sopherim. The presence of two separate Old Testament canons was the cause of bitter argument and controversy, and it was because of this that the Aramaean scholars in Edessa published the Peshitta version and became familiar with the Greek language and by it Greek science, Greek medicine and Greek literature. This is the second great factor in the Nestorian rôle in medicine.

The third great factor was the establishment of the great school of Edessa. The interest of the early Assyrian church fathers in the Greek version of the Scriptures and the resulting contacts with Greek scholarship created an atmosphere of study and investigation in the Assyrian towns, especially in Edessa and Nisibis. The latter town had changed hands several times between warring Roman emperors and Sassanian Persian kings. The emperor Julian died in 364 A D while fighting with the Persians. His successor, Jovian, made a rather ignominious treaty with the Sassanian Persian King Sapor II, in which he gave up Nisibis to the Persians. This resulted in a large part of the rich and learned Christian inhabitants of Nisibis migrating from that city to their coreligionists in Edessa. In the latter city, probably in 363-364 A D, they organized the School of Edessa which, because its founders had come from Persian territory, came to be known as the "Persian School" of Edessa. In this school, because of the previous activities of the church fathers in translating the Scriptures, theology was the major subject, but medicine was growing as a study, and rapidly coming to the fore in the attention it attracted. A hospital is said to have been founded by St. Ephraim and was used by the teachers of medicine in the school for clinical instruction.

The Ecumenical Council of Nicea in 325 had proceeded to define the Catholic faith and had apparently put an end to the Arian controversy. It is extremely difficult to reconcile the ideas of Monotheism and the Trinity, and to explain the relations of the persons of the Trinity to one another. The attempts to do so have resulted in endless arguments and these constitute a good part of Patristic literature. The Council of Nicea may have defined the orthodox faith, but it started many church controversies, only one of which is of interest in connection with the subject of this paper.

About the time of the founding of the Persian School in Edessa there was born near Mount Taurus an Aramaean priest named Nestorios. He became the Patriarch of Constantinople in 428. He early came into conflict with the orthodox fathers of the church because of his heretical doctrines, consisting in his denial of the complete merging of the divine and human natures in the person of Christ and especially in his assertion that Mary, the Mother of Christ, should not be called the Mother of God. For his heresies he was deposed at the Council of Ephesus in 431, and he and his many adherents in the Assyrian Church were excommunicated. His followers were as a result called Nestorians, and from the time of 431 have constituted the so called Eastern Syrian, or Nestorian, Church. This Church now is perhaps in itself uninteresting, but it had a profound influence on medical history.

The Nestorians, for we may now call the Eastern Syrians Nestorians, were largely concentrated in upper Mesopotamia and east of the Tigris. Edessa was their headquarters for a time, and the famous school became the center of their teaching. By 488 the controversy had flared to renewed activity and Bishop Cyrus of Alexandria, the arch enemy of the Nestorians, persuaded the Emperor Zeno to abolish the School. This was done in 489.⁹ This great school, the center of culture for the East, came abruptly to an end. The teachers and disciples were convicted of heresy, and expelled from Edessa. Many of them were given asylum in Persia, where their subsequent history will be

discussed later. The site occupied by the famous school was used to erect a new orthodox church and given the significant name of Our Lady, Mother of God.

The banishment of the Nestorians from the school and city of Edessa had several interesting results. The zealots became missionaries, many of the teachers and students turned to what they considered more profitable intellectual activity, that is, the study and practice of medicine. As Sarton¹⁰ so well puts it:

"The innate jealousy and irritability of theologians is a centrifugal force which continuously tends to drive farther and farther away those of them whose intellectual submission and conformity are not absolute. The cultural diffusion is thus accomplished not only by missionaries, but also by religious refugees and exiles, by those cast out, by heretics. The Nestorian heresy which originated in 431 is one of those great centrifugal forces due to theological hatred. It pushed Christianity across mountains and deserts as far as China, and thus became a very important link between East and West."

The Nestorians went on into Southern India and in Malabar organized a Nestorian church and community which still exists as a Christian sect. The church is known as that of Mar Thoma, or St. Thomas. This is the fourth great factor.

This is not the occasion to describe in detail the far reaching tours of the Nestorian missionaries. But from the fifth century on, following their expulsion from Edessa and then establishment in Persia, an increasing number of these Nestorian zealots penetrated eastward, reaching China, Siberia and India. This has been established by the excavations in Turkestan and China, where remains of Christian churches have been unearthed and MSS in Syriac and Persian, with the correspondence of these priests with their mother churches in Mesopotamia have been discovered. These have more than confirmed the amazing record carved in the famous Si-an-fu stone monument describing the introduction of Christianity into China in the seventh century by the Nestorian missionaries.¹¹

Following the closing of the school in Edessa many of the theologians, under the leadership of Bai Soma, the deposed head of the School, went back to Nisibis in Persian territory, whence the founders of the school had originally come, and established a new school there¹² Other teachers and pupils, perhaps less zealous in their strict Nestorianism, accepted the asylum offered them by the Sassanian King Kobad and migrated to Gondī-Sapor in southwestern Persia They brought with them Syriac translations of Greek medical works of Hippocrates and Galen by Sergius of Ra's al ain, and the earliest Syriac translations of Aristotle by Probos¹³ Here in Gondī Sapor they established the famous school where some of their co-religionists had previously, about 350, made that city the See of a bishop of the Nestorian Church¹⁴ Kobad was friendly to them because of help the Nestorians had given him in his escape to the Turks before regaining his throne¹⁵ (See Fig 3)

Attention must be given to the history of this city It was founded in 260 A.D. by Sapor I, son of Ardashir Babakhan, founder of the Sassanian Dynasty of Persia, soon after his defeat and capture of the Roman Emperor Valerian and the sacking of the famous city of Antioch (See Figs 1 and 2) Sapor named the new city Veh az Andev i Sapor, meaning in Pahlawi "Sapor's Better than Antioch," a name which was gradually changed to Gondī-Sapor, or in Arabic, Jundi Sabur It was situated in southwestern Persia in Susiana, what is now known as the province of Khuzistan, not far from Susa The Mohammedans captured the city in 638, in the reign of Omar, the second Khalif By the thirteenth century, however, it had almost disappeared There is no trace of the city left at present except vague mounds marking the former walls and buildings, and the site is partly occupied by a small village called Shahabad Sir Henry Rawlinson¹⁶ and Layard¹⁷ are two of the last travelers to describe the present remains of this city of glorious record

The Persian school of medicine in Gondī Sapor, always under Nestorian inspiration and management, flourished from the time of Nushirwan, 530 A.D., Kobad's successor,



FIGURE 1—Gold Coin of Sapor I,
253-260 A D Founder of the City
of Gondī-Sāpor

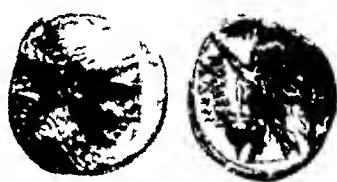


FIGURE 2—Silver Coin of Emperor
Valerian Captured by Sapor I

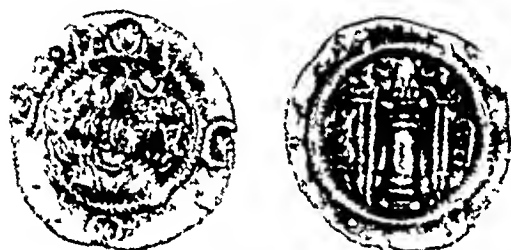


FIGURE 3—Silver Coin of Kobad
Offered Asylum to the Nestorians in Gondī-Sāpor

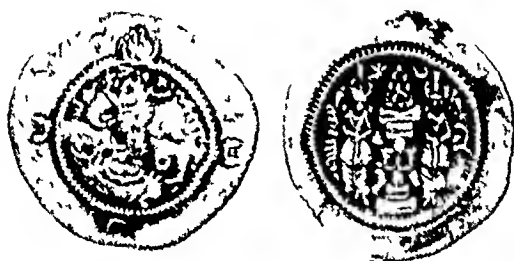


FIGURE 4—Silver Coin of Chosroë Nushirwan
Founder of the Medical School of Gondī-Sāpor

until at least the end of the tenth century, when Baghdad replaced it as the center of medical teaching. The greatest impetus to the school was given by the most famous of the Sassanian kings, Nushirwan, called Adil, or the Just (See Fig 4). He not only gave the Nestorian teachers in the school every advantage and encouragement, but he increased the prestige of the institution by welcoming to it the Greek Neo Platonists from the school of Athens, when it was closed in 529 A.D. It became, during Nushirwan's long reign of forty eight years, the greatest intellectual center of the time. Within its walls Greek, Jewish, Nestorian, Persian and Hindu thought and experience were freely exchanged, but the Nestorian teachers were the most prominent and the teaching was done largely in Syriac or Aramaic, because the texts of the Greeks, Persians, Jews and Hindus were translations in that language. It was during Nushirwan's long reign that Pahlawi literature reached its zenith. He ordered the historical annals of Persia to be compiled and from the material collected the greatest Persian epic was composed by the poet Firdausi at the end of the tenth century. Under the great king's aegis Persian translations were made of Plato and Aristotle.

Nushirwan became the hero of story and song by later historians and poets who lauded his wisdom and justice, for he is always spoken of as Nushirwan Adil, the Just. In Sâdi's *Guhstan*¹⁸ there is a simple tale, in Persian, typical of his justice, one of the many in the *Book of Kings*. It reads: They have related that at a hunting ground they were roasting the game for Nushirwan, the Just, but there was no salt. A slave was dispatched to a village for the needed seasoning. Nushirwan said, "Be sure that you obtain the salt at a price, that a bad custom be not established and the village be not ruined." They asked, "What loss could come from such a trifle?" He replied, "The origin of tyranny in the world was small at first, others have added to it, till it has reached its present state." Stanzas 1. If the King were to eat one apple from the orchard of a subject, his slaves would pluck up the

tree by its roots 2 For five eggs which the Sultan might deem lawful plunder, his army would run through a thousand fowls with spits

To return to the Great School Opposite it was built the famous hospital, the Bimistan, a Persian name used subsequently for all the great hospitals in Baghdad, Damascus and Cairo which the Arabs copied from this model in Gondisapor Describing this hospital Ibn al Qifti¹⁹ says (Quoted from Ahmed Issa Bey²⁰)

"They [the physicians] made rapid progress in the science, developed new methods in the treatment of disease along pharmacological lines, to the point that then therapy was judged superior to that of the Greeks and the Hindus Furthermore these physicians adopted the scientific methods of other peoples and modified them by their own discoveries They elaborated medical laws and recorded the work that had been developed

In the twentieth year of Nushirwan's reign the physicians of Gondisapor convened by order of the sovereign to discuss diversified scientific subjects Their debates were recorded This memorable seance was presided over by Gibrail Dorostbad, the special physician to the King, assisted by the Sohstar and their colleagues, by Yohanna and a large number of other physicians

During several centuries the School and Bimistan of Gondisapor held first place in the world of Medicine and Science It was from among their students that Persia, Iraq and Syria recruited their physicians Pupils from all nationalities gathered in Gondisapor for instruction Furthermore the Islamic conquerors did not hesitate to call into service the physicians trained in this school "

The Prophet and the first Khalifs were treated by Harith Ibn Kalada el Thakafi and by his son Nadr Ibn Harith, graduates of Gondisapor The Ummayyad Khalifs were cared for by Ibn Uthâl, a Christian practitioner of Gondisapor, and other diplomats of that school The trust confided in the school of Gondisapor and its graduates was deserved primarily for its eminence and the

renown of the faculty and the ability of its graduates. But there was one factor, little appreciated in the coming of the Nestorians to the Persian school, and that had to do with the excommunication and banishment of the Nestorians from the orthodox Catholic church. The denial of the Motherhood of God in Mary appealed to both the Persian Zoroastrians and to the later conquerors, the Mohammedans, but especially the latter. In what is almost the last Sura of the Qu'ran, the one hundred and twelfth, entitled "The Unity," four short sentences sum up the denial of the Trinity and of the Virgin Birth.

- 1 Say, He Allah, is one
- 2 Allah is He on whom all depend
- 3 He begets not, nor is he begotten
- 4 And none else is like unto Him

It was the third line of this Sura, in the rich melodious Arabic "*Lam Yalid wa lam Yulad*" which set the Nestorians apart from other Christian infidels and gave them special favor in the eyes of the prophet and his succeeding Khalifs. From this Nestorian community, educated and wise in the medical science of that era above all others, the nascent and vile Arabs eagerly sought their earliest and then later training in Greek and Galenic medicine, and rekindled that torch of ancient learning with the whirlwind of their newly awakened interest and enthusiasm for learning.

From Gondī Sapor went a long line of distinguished physicians: the famous family of the Bakhtīshūs, the Mēshūs or the Mesue, to mention only two renowned families, to Baghdad, to Damascus, to Cairo where they organized famous hospitals, modeled after the great Bimaristan of that Persian city. For a most interesting account of these Bimaristans, their buildings, their teaching clinics with in- and out-patient buildings, with medical, surgical, orthopedic and ophthalmological services, all copies of the famous hospital in Gondī Sapor, the reader is recommended to study the monograph of Dr. Ahmed Issa Bey²⁰ on the hospitals of the Islamic period. It is a most surprising

ing and illuminating exposition and proof that Arabian medicine made full use of the lore handed down through the Nestorians

In the preparation of this paper the author has consulted original sources in Latin, Syriac, Arabic and Persian but he wishes to express his indebtedness to Sarton's "Introduction to the History of Science," Carter's "Invention of Printing in China," Ahmed Issa Bey's "Histoire des Bimaristan," and especially to Professor Philip K Hitti of Princeton University for his many suggestions and constructive criticism

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BELL, JAMES FINLEY, M.D, Englewood, New Jersey, graduated in medicine from New York University College of Medicine in 1883, elected a Fellow of the Academy, February 4, 1897, died June 16, 1936. Dr Bell had been on the staff of the Englewood Hospital since 1901 and was known for his bacteriological studies on milk. He was a member of the American Medical Association and of the County and State Medical Societies.

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THE INITIAL SYMPTOMS AND EARLY DIAGNOSIS OF TUMOR OF THE BRAIN*

ISRAEL STRAUSS
New York

Theoretically the sooner a tumor of the brain is recognized and the patient treated, the more favorable as a rule should be the effect of therapy. Unfortunately, such is not always the case. In this study it was found that poor therapeutic results were obtained in many of the individuals in whom the tumor was recognized shortly after the onset of the disease, whereas operative successes were prevalent in patients with clinical history of long duration. This is a paradox, but it can be resolved to some extent if each case of tumor of the brain be considered individually. It must be remembered that the life cycle of a cerebral neoplasm which is encapsulated is longer than one which is infiltrating, so that when a tumor is discovered three months after the first symptom appears, the diagnosis is considered to have been made early in the case of a meningioma but late in the case of a spongioblastoma multiforme. Again the term "early diagnosis" is a relative one and depends on the element of time, the time referred to is the interval between the onset and the recognition of the disease. This clinical interval is determined by such variable factors as rate of growth, histological nature, location and size of the tumor, as well as by the age and general condition of the patient.

* Presented at The New York Academy of Medicine Friday afternoon lecture series, January 4, 1935.

From the Neurologic Service of the Mount Sinai Hospital, New York, in collaboration with Dr. M. B. Bender.

How early can a tumor of the brain be discovered? It can be recognized as soon as there are symptoms, and when the severity and disabling nature of the complaints bring the patient to the physician. The symptoms usually emphasized as the most important manifestations of tumor of the brain are headache, nausea, vomiting, and choked disc. With the possible exception of headache, these denote intracranial hypertension and usually appear late in the course of the disease. When such manifestations exist they are significant, but in order to enable one to make an early diagnosis in these cases, it is essential to be well acquainted with the early symptoms of tumor of the brain. It is well known that evaluation of complaints at the onset of an illness is extremely difficult, so that with a paucity of physical signs from which to judge, and in the absence of papilledema, the physician may not be inclined to make a diagnosis of intracranial tumor, even though he may suspect it. What usually happens is that unless the symptoms are discomforting, the reluctant patient and the puzzled doctor refrain from further investigation until additional manifestations appear. This is especially true in cases of neoplasms involving the so called "silent areas."

In this communication, attention will be directed particularly to the early part of the clinical course, especially to the initial symptoms and physical signs noted on the first admission to the hospital. For this purpose and for the sake of convenience in calculating percentages, the case histories of the last one hundred histologically verified neoplasms were reviewed.* The study was facilitated by arranging the records according to the duration of complaints from onset until the time of the first admission to the hospital, the shortest period was ten days (Case No. 1) and the longest period nineteen years (Case No. 100). These were then divided into groups, with an approximately equal number of cases in each. (See tables.)

* A majority of the facts cited in this review were based on a series of 500 patients examined at the Mount Sinai Hospital for intracranial tumor, which was verified by operation or necropsy or both.

When classified in this manner, it was found that most cases of tumor of the brain revealed a history of relatively brief duration. At the same time it was noted that a majority of these neoplasms were of the rapidly developing and infiltrating variety, when the neoplasm was encapsulated, the clinical course was prolonged.

GROUP I

(Duration of symptoms from onset until first admission to the hospital—one month and less)

Cases belonging to this group have been described as "acute brain tumors." The onset was abrupt, symptoms severe, and the course, at times simulating an acute systemic disease, rapid. A few patients were referred to the hospital as emergency cases because their cerebral manifestations were extraordinarily violent. In several instances the course was so rapid and fulminating that there was not sufficient time for confirmatory investigations. Five of them ceased before any operative interference could be undertaken.

Thirteen of the seventeen tumors in this group were of the infiltrating spongioblastoma multiforme variety, and supratentorial in position. Because these neoplasms expanded rapidly, the organism did not have sufficient time to accommodate for the rather sudden changes in intracranial equilibrium. Consequently, new manifestations evolved within a few days, or even hours after the onset of symptoms. It was not surprising also to find that in some patients papilledema developed over night. When several symptoms appeared in rapid succession, it was almost impossible to distinguish as to which one of them came first, so that they all seemed primary. This relative multiplicity of initial complaints was found to be most prevalent in patients with histories of brief duration. In these instances the tumor was recognized "early" because there were enough symptoms and signs upon which to base a diagnosis, and the histories, therefore, were short.

In this group, the most prominent initial symptom was headache, which was often distressing and paroxysmal in character. Mental changes and disturbances in speech due

to aphasia were next in order of frequency. Physical signs, present in all but one instance, were meager, and except for aphasia were of little localizing value. Papilledema occurred in twenty-four per cent of the cases. This low incidence may be explained by the fact that the tumor with a short clinical history, although causing profound subjective complaints, did not expand sufficiently to produce choking of the optic nerves.

The following cases are examples of the so called acute brain tumors. Despite the fact that they were diagnosed at the earliest possible period, the therapeutic results were poor (Table III). The unfavorable results were due to the fact that the tumors were histologically malignant. Surgical therapy in some of these patients prolonged life for several months, but these afflicted individuals were as a rule helpless, so that in reality the gains derived from therapy were nil.

SERIES CASE No 5—A P—A twenty-nine year old male was referred to the hospital with a diagnosis of suspected brain tumor. He was in good health until two weeks ago, when there developed dizziness. Three days before admission he complained of severe frontal headache which became progressively worse. The following day, he vomited several times, and on the day before admission he became irrational, talkative, and unmanageable.

Examination revealed a well-nourished man who appeared acutely ill and toxic. Temperature 100° F. Pulse 66. He was extremely garrulous, boisterous, and emotionally unstable. He was violently restless, requiring mechanical restraints to keep him in bed. He was totally confused and disoriented in all spheres. His memory for remote and recent events was severely impaired. There was a slight rigidity of the neck, and slight tremors of outstretched hands. Lumbar puncture showed an initial pressure of 180 to 200 mm. of water, and six cells per cu. mm.

The patient became progressively drowsy. Intravenous injection of hypertonic glucose solution and a repeated thecal puncture yielded no improvement. The spinal fluid obtained on the second examination, four hours after the

first tap, was under an initial pressure of 220 mm of water and contained 140 polymorphonuclear leucocytes per cu mm. Declining rapidly and in the midst of a preparation for an emergency subtemporal decompression, the patient suddenly became cyanotic and died, twenty-four hours after admission to the hospital.

Autopsy revealed a colloid cystic tumor 7.5 mm in diameter involving the septum pellucidum.

COMMENT Although the tumor was small and histologically benign, the clinical history was acute and rapid. The symptoms were due to the location of the neoplasm, the latter being "silent" until it blocked the flow of cerebrospinal fluid, causing an acute internal hydrocephalus. The clinical course, especially during the last twenty-four hours, was so fulminating that there was not sufficient time to confirm the suspicion of an unlocalized expanding intracranial lesion. Brain tumor was surmised because of the organic mental picture associated with severe headache and dizziness. There is no doubt that these symptoms may also occur in meningitis. In fact, the latter was considered in the differential diagnosis, and was excluded only after the first examination of the spinal fluid, although the pleocytosis on second examination revived the diagnosis of a possible meningitis.

In this particular instance it was almost impossible to make a diagnosis of intracranial tumor at any earlier period, although early surgical intervention might have been successful because the tumor was small and histologically benign.

SERIES CASE No. 6 — P B — A twenty-eight-year-old French business man was admitted to the hospital with the history that during the last two weeks it was noted that he had lapses of memory for his trade sales prices and difficulty in rapid calculation. Shortly thereafter, the patient's wife observed that he spoke to her in English, and spoke French at his place of business. This was the reverse of his customary speech habits. One week ago he vomited, and on the following day he had a period of confusion. He was found standing under a shower bath, clad in pajamas

and bath robe, gazing vacantly about him, totally unaware of his surroundings. The family doctor advised observation at a mental hospital for an impending psychosis. When the patient applied to the Bellevue Psychiatric Hospital, he presented no obvious mental symptoms and was advised to go home. Two days later, he was unable to answer questions for a few seconds. He simply remarked that his mind was blank. He was seen by one of us, and despite negative physical findings was referred to the Mount Sinai Hospital with the diagnosis of "probable tumor of the brain."

At the hospital, neurologic investigations gave negative results. During the examination it was noted that the patient had transient episodes in which he was entirely unable to speak, and his mind, as he said, had "gone blank." The examiner described these episodes as being similar to catatonic states. When the patient was asked to write his name, he scribbled something in French which was irrelevant. A few hours after admission, there developed a series of convulsions, and he died in a status epilepticus twenty-four hours after entering the hospital.

Autopsy revealed a ganglioglioma of the left prefrontal lobe.

COMMENT Obviously, the diagnosis was difficult. At first the patient was suspected of suffering from an expanding intracranial lesion, and not until convulsive seizures appeared was the diagnosis of cerebral neoplasm confirmed. The chances of an earlier diagnosis in this patient were unlikely, because the entire symptomatic period was so short. This is another example in which the rapid clinical course suddenly terminated fatally, and before any therapy could be instituted.

SERIES CASE No. 7—H B—A fifty-year old storekeeper was admitted to the Neurologic Service complaining of headache. Perfectly well until two weeks before admission, there suddenly developed headache, and he found that he was unable to express himself clearly. The speech difficulties, transitory in character, recurred at irregular intervals and became bothersome and irritating. Between attacks he was free of symptoms. After one week the headaches returned and again disappeared. In the last twenty

four hours the pains in the head returned, this time accompanied by a persistent handicap in his speech. He was unable to answer questions, to concentrate, or to do simple arithmetical problems. He did not seem to understand what was asked of him. His memory for recent events became impaired. Seven hours prior to admission he complained of numbness in the right arm which spread one hour later to involve the lower extremity on the same side. During the last twenty-four hours he became progressively drowsy.

On admission to the hospital, the systemic examination was essentially negative. Blood pressure 130/88. Aphasic status revealed a mixed aphasia, predominately sensory in character. He made vain efforts to obey complicated commands. He was embarrassed and exasperated by his aphasia, because it made him feel that he "must be a dummy." He was restless, apprehensive, and irritable. The neurologic status revealed a faint hemiparesis and increase in the deep reflexes on the right side. The rest of the examination gave negative results.

COURSE On the day after admission there was a marked improvement in symptoms, the only remaining physical sign being a slight anomia. Twenty-four hours later, the slight aphasia disappeared and the patient became practically "normal."

The clinical diagnosis was tumor of the brain, but with the marked and rapid improvement and complete disappearance of signs, it was soon changed to thrombosis of a branch of the left middle cerebral artery, although a neoplasm involving the left temporal lobe was still entertained. He was discharged and observed in the follow-up clinic for three months, during which time he had no complaints. Three and a half months after he left the hospital, there developed headache and he became drowsy and depressed. This lasted for two and a half days, after which he suddenly improved and became cheerful and again free of symptoms. On the night before admission, he felt sleepy, and on the following morning he could not be aroused.

The patient was readmitted in a comatose state. An emergency exploratory craniotomy was negative. Autopsy

twenty-four hours later revealed a spongioblastoma multi forme involving the posterior subcortical portion of the left temporal lobe

COMMENT This case illustrates the possibility of complete remissions in the course of a brain tumor. A more familiar example of remissions in symptoms is the periodic attack of convulsive seizures and the relative freedom from symptoms between attacks. In this series of one hundred intracranial neoplasms, the most striking feature in the histories was that the course was intermittent. An improvement or complete remission in a patient suspected to be suffering from a tumor of the brain should not alter the original suspicion.

SERIES CASE No 17—F C—An Italian male, aged forty six, was admitted to the Neurologic Service with the history that for the last eight years he had suffered from pain in the lower back, and for the last two or three years he had had cramps in his legs. Except for the above complaints, he had been well until four weeks before admission, when there developed severe and persistent headache. The following week, there suddenly developed weakness and numbness in the right upper limb. In addition, he complained of periodic twitchings of the right hand and corner of the mouth, associated with momentary losses of speech. During the week prior to admission, weakness in the right arm became more pronounced, he had difficulty in expressing himself, and, in the last few days, gradually became drowsy.

On admission, the patient was apathetic. A few spontaneous jerky movements were noted in the left face and upper extremity. There was slight rigidity of the neck, and a suggestive positive Kernig sign. Despite the fact that the patient was drowsy, irritable, and resistive to examination, it was possible to elicit a mixed aphasia. There was a hemihypalgesia and flaccid hemiplegia associated with pyramidal tract signs on the right side. The optic discs showed questionable edema. The right pupil was irregular and greater than the left. Both reacted sluggishly to light and well in accommodation.

The clinical diagnosis was neoplasm of the left cerebral hemisphere. Syphilis was suspected only because of the pupillary signs.

A lumbar puncture showed xanthochromic fluid under an initial pressure of 180 mm of water. There was no block to jugular compression. The fluid contained traces of globulin, total protein 180 mgms per 100 cc, and 7 lymphocytes per cu mm. The Wassermann and Kahn reactions of the blood were four plus, spinal fluid Wassermann one plus, colloidal gold curve 22233321110.

With these serological tests, the diagnosis of tumor of the brain became less certain, although it was still entertained. Since there was a possibility that lues might present such a clinical picture, the patient was subjected to antiluetic therapy, to note whether any improvement might take place. The ultimate intention was to operate for a neoplasm, but the patient died suddenly, twelve days after admission.

Autopsy revealed a glioblastosis with spongioblastomatosis of the left cerebral hemisphere.

COMMENT. Clinical judgment prompted what proved to be the correct diagnosis: cerebral neoplasm. The positive Wassermann reactions complicated and temporarily hindered the contemplated surgical intervention. Although syphilis may simulate any disease process, it is uncommon for a symptom complex such as this patient presented to be caused only by spirochetal infection. Severe headache with well localized cerebral signs and symptoms should always prompt the suspicion of a tumor of the brain, even in the presence of serological evidence of lues. In this series of one hundred cases, four patients had an unequivocal history of syphilis. In two instances, the diagnosis of brain tumor was delayed because clinical judgment was allowed to be superseded by laboratory findings.

GROUP II

(Duration of symptoms from onset until first admission to hospital —over one to two months)

Except for the fact that the duration of the clinical course in this group was longer than in Group I, the symp-

tomatology was practically the same. The pathology in the two groups differed insofar that the number of gliomas in the second group was less than in the first, the discrepancy being caused by tumors of the sarcoma and metastatic carcinoma types. The spongioblastic neoplasms here were discovered later than those in Group I. The explanation for the postponement in diagnosis in these instances may be that diffusely infiltrating tumors sometimes attain large dimensions and yet produce symptoms insufficiently outstanding to attract early attention, the tumors continue to expand until, due possibly to a sudden increase in the intracranial pressure, there results an increase in objective and subjective symptoms, making the diagnosis of tumor of the brain obvious. Another reason for the delay in diagnosis is that aphasia was less frequent here and in subsequent groups than in Group I. (Table II and Fig. 1.)

Aphasic manifestations, even if minimal, are usually intimidating enough for the patient to seek early medical advice. The better trained physician, in turn, recognizes the aphasia, and without further delay proceeds to search for its etiology, consequently making an early diagnosis possible. It may also be that although aphasia plays a significant role in the early recognition of tumor, in its absence there are other manifestations which, if distressing enough, will rouse the prompt attention of the patient and the physician. In the event that there is no aphasia, the neoplasms continue to develop and become evident through severe headaches, mental changes, motor weakness, or, at a later date, papilledema.*

* A higher incidence of choked disc was noted in patients with tumors unattended by aphasia, as compared with those in whom aphasia was present. This observation was derived from a study of 150 cases of tumors which involved either the right or the left cerebral hemisphere. Of these, 112 patients did not present speech disturbances either in the history or at the examinations on admission to the hospital, the remaining 38 patients did. Among the cases without aphasia, the incidence of papilledema was 58 per cent, whereas in cases where aphasia was manifest, the incidence was 10 per cent.

FIGURE I

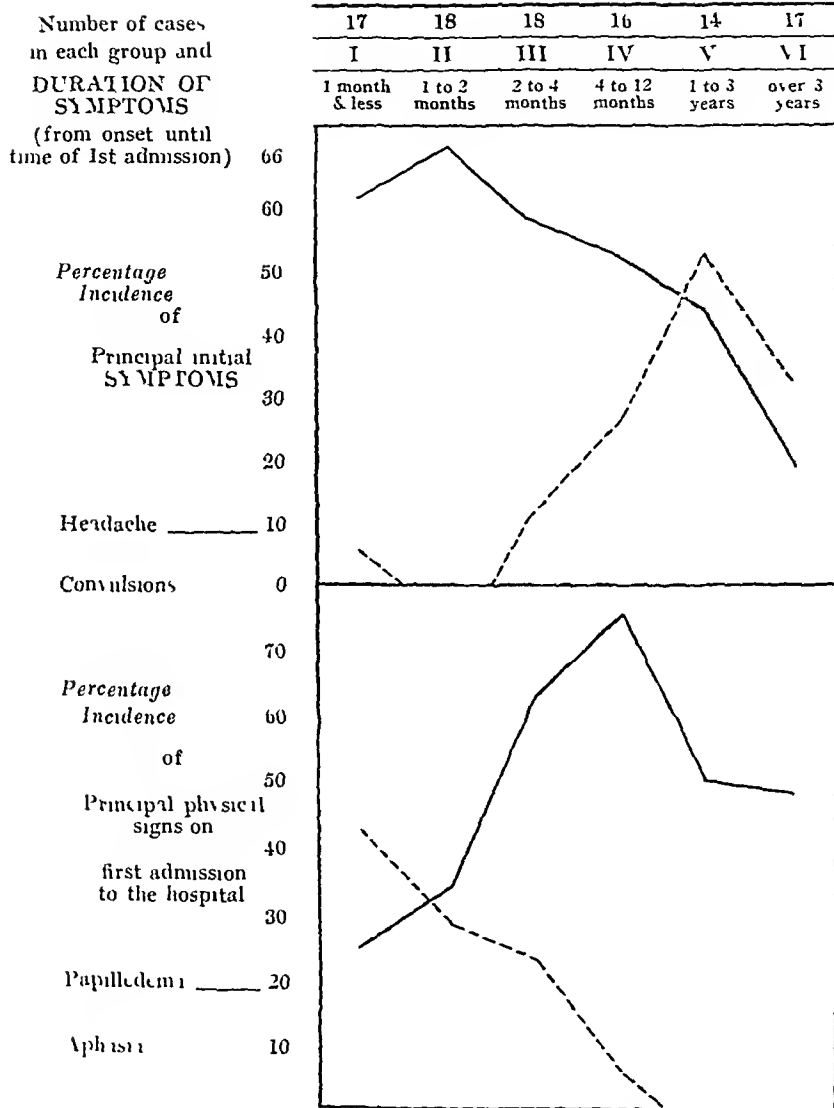


Figure I illustrates graphically the reciprocal relation which was found to exist between the percentage incidence of the initial symptoms headache and convulsions, and between the percentage incidence of papilledema and aphasia observed on the first admission to the hospital.

As in Group I, headache was again foremost among initial complaints. In fact, the incidence of its occurrence was even more frequent. As regards the physical signs, it has already been mentioned that the incidence of aphasia was declining, whereas that of papilledema was reciprocally on the increase. (See Fig I)

The following case illustrates the difficulties involved in the diagnosis of tumor when the physical signs are meager. The tumor was located in the right hemisphere, and since the patient was right handed, aphasia was not present, the disease, therefore, was allowed to progress until choked disc appeared.

SERIES CASE No 19—B H—A twenty six-year old house wife was admitted with the history that during the last four and a half weeks she had experienced intermittent attacks of severe headache. Three weeks before admission she vomited several times, and since then had occasionally felt drowsy.

Physical and neurologic examinations gave negative results. The patient was suspected of having a tumor of the brain, but no definite diagnosis could be established. Lumbar puncture showed an initial pressure of 110 mm of water. An encephalogram was performed, but no air was visualized in the ventricles. While in the hospital, she continued to vomit and to complain of severe headaches. Two weeks after admission, slight blurring of the disc edges was noted, and a few days later frank papilledema and a left facial weakness appeared. A second air study, this time a ventriculogram, was also unsuccessful. Finally an exploratory craniotomy revealed a microgloma involving the posterior and inferior portions of the right frontal lobe.

COMMENT This case illustrates the difficulty of recognizing neoplasms located in the so called "silent areas." The patient was suspected to be suffering from tumor because of the severity and paroxysmal nature of the headaches, associated with vomiting and drowsiness. There were no localizing signs and no objective evidence of intra

TABLE I

	GROUP	I	II	III	IV	V	VI
	Duration of symptoms from onset until first admission	1 month	1 to 2 months	2 to 4 months	4 to 12 months	1 to 3 years	over 3 years
	left	2	1	3	2	1	9
	right						1
	both	1	1			1	2
Tumors located above the tentorium	Frontal						
	Temporal	3	1	3		3	11
	right	1	1		1		1
	total						4
(a) Single lobe	Parietal	1		1			2
	left	1					1
	right	1					1
	total						2
(b) Combination of lobes	Occipital				1	1	1
	left						1
	right						1
	total						2
(c) Periventricular	In one hemisphere	3	3	1	1	2	14
	left	2	2	3	3		13
	right						1
	total						9
(c) Periventricular	In both hemispheres	1	4	1	2		8
	multiple						1
	midline	1	2		2		5
	total						10
(c) Periventricular	Region of 3V and pituitary body	15	15	15	12	8	77
	total						77
Tumors located below the tentorium	Cerebellar	2	3	3	4	1	15
	Cerebello-pontine angle					5	5
	total						8
	total	2	3	3	4	6	23
Tumors located below the tentorium	Grand Total	17	15	15	16	14	100
							100

Table I illustrates the distribution of the tumors in each group as to location within the cranial cavity and brain

cranial hypertension. To confirm the presence and location of the cerebral growth, pneumoencephalograms of the skull were performed, but unfortunately the ventricles were not visualized, so that operation was delayed until physical signs appeared, i.e. choked disc and left facial weakness. Unless the subjective symptoms are properly evaluated and x-ray studies employed, the absence of objective signs frequently prevented the early diagnosis of tumor of the brain.

GROUP III

(Duration of symptoms from onset until first admission to hospital—over two to four months)

This group was composed partly of malignant neoplasms which were recognized late in their course, and partly of benign tumors discovered relatively "early." Included among the malignant variety were the spongioblastoma multiforme, the less malignant transitional cell gliomas, and the metastatic carcinomas, among the benign or encapsulated tumors were those of the meningioma group (Table III). The diagnoses in all of these instances were hindered because the primary symptoms were not as severe nor as manifold as in the "acute brain tumors." In the incipient stages of the disease, either the patient hesitated to consult the doctor or, when examined, did not exhibit objective signs significant enough to warrant a diagnosis.

Headache, again the most common primary symptom, was not as painful nor as frequent in occurrence as in the former groups (See Table II). Despite the fact that ten of the tumors were situated in or about the speech center (Table I), disorders of speech were relatively uncommon. Aphasia did appear in a few of the latter instances, but became evident only after admission to the hospital. As if to replace the lack of this valuable diagnostic sign, there was a rise in the incidence of choked disc, and the major portion of this increase, in this as well as in the next group, was contributed by the infiltrating gliomas (Tables II, III, Fig. I). In other words, the tumors expanded until they became manifest either by early appearance of aphasia or by late development of papilledema. There were other

TABLE II

Group		I	II	III	IV	V	VI	Total
Number of patients in each group		17	18	18	16	14	17	100
Duration of symptoms (from onset until first admission)		1 month and less	1 to 2 months	2 to 4 months	4 to 12 months	1 to 3 years	over 3 years	
Headache		59	66	56	50	42	18	48
Convulsions		6		11	25	50	30	20
Mental changes		35	33	6		7		15
Visual disturbances (diplopia—poor vision)			17	17	25		30	14
Speech difficulties (aphasia)		29	28	11				11
Dizziness		12	11	11		7		7
Motor weakness, paresthesias			11	22	6			6
Deafness, tinnitus						13	23	6
Vomiting			11	11				4
Endocrine dysfunctions							18	3
Unsteadiness in gait					13			2
Papilledema		21	33	63	75	50	47	48
Aphasia		12	28	22	6			16

Principal physical signs on first admission to the hospital

Table II illustrates the percentage incidence of the principal initial symptoms and of papilledema and aphasia observed on the first admission to the hospital in each group

signs, such as defects in the visual fields, facial weakness, and reflex changes, which, if discovered early and properly evaluated, might have led to an earlier diagnosis. Unfortunately, however, such was not the case, because most practitioners are inexperienced in testing the perimetric fields, in evaluating a slight difference in reflexes, or in interpreting the significance of a poor plantar response when testing for a Babinski sign. Some of them may ignore the value of many essential neurologic tests and the slight variations in physical signs which the patients may exhibit, and concentrate chiefly upon the eye grounds to look for papilledema. When they do not find papilledema, they disregard the history and whatever physical signs there are, and exclude the possibility of tumor of the brain in the diagnosis of the disease.

The following case history is an illustration of a malignant neoplasm not recognized until late in the course of the disease.

SERIES CASE No 37—R C—A female, aged fifteen, was admitted with the history that nine weeks prior to admission she suffered severe headaches, vague abdominal pains, and vomiting. A physician attributed the malady to chronic appendicitis. Five weeks later there developed an internal ocular squint. Despite this eye symptom, an appendectomy was performed on the patient because of the persistence of the abdominal symptoms. Following the operation, she became drowsy, continued to be nauseous, and vomited. Three weeks before admission there developed diplopia and fine tremor of the right hand. Two days before admission she complained of severe headaches and dizziness, had two generalized convulsions, and became increasingly stuporous.

Examination revealed an undernourished female in deep stupor. Spontaneous twitchings in the right face were noted. There were a spastic hemiparesis and concomitant pyramidal tract signs on the right side, bilateral high grade papilledema, and a stiff neck. A spinal tap showed increased fluid pressure with 52 lymphocytes and 140 R B C per cu mm.

TABLE III

GROUP	I	II	III	IV	V	VI
DURATION OF SYMPTOMS (from onset until first admission)	1 month	1 to 2 months	2 to 4 months	4 to 12 months	1 to 3 years	over 3 years
						total
GLIOMA	18	9	11	6	4	47
MENINGIOMA	1	1	3	8	5	21
METASTATIC CARCINOMA AND SARCOMA	2	6	4	1		11
NEUROFIBROMA					4	3
PITUITARY ADENOMA		1				6
MISCELLANEOUS	Colloid Cyst 1	Tuber- culoma 1		'Cranio- pharyn- gioma 1	Tuber- culoma 1	Cholesteo- toma 1
NUMBER OF CASES IN EACH GROUP	17	18	18	16	14	17
NUMBER OF PATIENTS OPERATED UPON	12	14	16	16	13	16
NUMBER OF PATIENTS SURVIVED 1 YEAR OR MORE AFTER OPERATION	0	2	3	4	5	6
						20

Table III illustrates the distribution of the tumors in each group as to type and as to operative results

An emergency right subtemporal decompression was performed. The patient died on the day after admission to the hospital. Necropsy disclosed a spongioblastoma in the left thalamic region.

COMMENT. This patient had at least two definite cerebral symptoms which should have aroused the suspicion of intracranial disease: at first, attacks of severe headache, and later, ocular squint—both of which are common in the course of a tumor of the brain. The abdominal pain, which apparently was erroneously attributed to chronic appendicitis, may also have been due to the tumor of the brain. Disease in the region of the basal ganglia may sometimes produce pain simulating gall bladder or appendiceal disease. Not until other and more intense cerebral symptoms appeared was intracranial pathology suspected, and by the time the patient was transferred to the Mount Sinai Hospital it was late in the course of the illness. The diagnosis was delayed because too much reliance was placed on the abdominal complaints, which in retrospect were actually of cerebral origin, whereas little or no attention was paid to symptoms such as headache and ocular squint.

GROUP IV

(Duration of symptoms from onset until first admission to hospital—over four to twelve months)

Here, the initial complaints, fewer in number, were insidious in onset and less annoying to the patient. Coming to the foreground as early symptoms of intracranial tumor, in this and in the subsequent groups, were convulsive seizures. The attacks, usually in the disguise of epileptic equivalents, were transient, infrequent, and not sufficiently disturbing for the patient to seek immediate medical attention.

Physicians are well aware that convulsions or then recognized equivalents usually imply disturbed intracranial function. They also know that convulsions are frequently caused by tumors of the brain, and that one way in which the latter may be excluded is by intracranial air injections. The physician may consider encephalogram as

an aid to diagnosis, but to nige a reluctant patient to submit to such studies is difficult for two reasons. In the first place, a patient with a brain tumor who has as the only symptom convulsive seizures may feel perfectly well between attacks. He refuses to admit that he may be ill, and shuns the suggestion that he enter the hospital, though it be merely for observation. The doctor, on the other hand, who does not find objective signs to verify his suspicion of intracranial tumor, is not inclined to press the patient too firmly, especially when the patient feels comfortable and protests that he is "not sick." Consequently, the neoplasm continues to expand, and only when additional manifestations appear does the problem demand solution. As previously stated, this indecision and procrastination probably accounts for the increasing incidence of papilledema in patients with "delayed" diagnoses.

As each group was studied, it became evident that the longer the clinical course the more probable it was that the tumor was benign. Eight of the neoplasms in this group were of the meningioma variety (Table III).

The following case history is an example of how the diagnosis of an intracranial neoplasm may be delayed when the optic fundi reveal no papilledema.

SERIES CASE No 64—J B—A male, aged seventeen, complained that ten months before admission he saw double on looking to the left. The patient consulted an optician and was told that his vision was good. To avoid the diplopia, the patient postured his head to the right and rotated it slightly to the left, except for this abnormality, he felt well. Six months later, there developed severe occipital headache and unsteadiness in gait for which he compensated by walking on a wide base. This time he consulted a physician, and was told that he had encephalitis, he was treated for the latter, but without effect. Later he was treated for multiple sclerosis. Not until nausea, vomiting, and dizziness appeared, ten days before admission, was a tumor of the brain suspected.

On admission the patient complained of severe throbbing headache, which throbbing was synchronous with his pulse

beat The gait was unsteady and broadbased, coordination movements were poor in the left upper and lower extremities, there was dysdiadokokinesis on the left, diplopia on looking to the left, marked nystagmus in all directions, and normal optic fundi He was somewhat anxious, slightly overtalkative, and perhaps euphoric

The clinical diagnosis was hemangiomatous tumor of the left cerebellar lobe Ventriculogram showed a marked symmetrical internal hydrocephalus Craniotomy revealed a large cystic hemangio endothelioma in the left cerebellar hemisphere, with a mural nodule the size of an English walnut

COMMENT The diagnosis was delayed because the patient was not sufficiently inconvenienced to seek medical aid When he did consult a physician, the condition was not recognized because the patient did not have papilledema The absence of papilledema was considered a factor against the diagnosis of tumor of the posterior fossa It must be emphasized that choked disc is a late sign of intracranial tumor, and that it is not necessary to await its appearance in order to establish the correct diagnosis The ventriculogram in this case demonstrated that there may be marked internal hydrocephalus due to intracranial hypertension, without there being concomitant papilledema Because papilledema was absent in the early course of many cases of tumor of the brain, an erroneous diagnosis was not infrequently made, in the young individual, the most frequent erroneous diagnosis was encephalitis, and in the aged it was cerebral arteriosclerosis

GROUP V

(Duration of symptoms from onset until first admission to the hospital—one to three years)

In this group, the early symptomatology was even more indefinite than in the previous groups, and the course was characterized by long remissions and chronicity As a primary symptom, headache was usually not intolerable and did not recur for long intervals Continually increasing in incidence, convulsive seizures became equally as frequent as headache Six of the eight patients with supra

tentorial neoplasms had epilepsy or its equivalent as their first symptom two of them had generalized convulsions, and the remaining four complained of clamp-like seizures localized to one side of the body or attacks of syncope

It was noted that in this and the next group, tumors of the cerebellopontine angle were common. The physical signs on admission were those expected in growths implicating the eighth cranial nerve and adjacent structures, and the tumor was therefore easily localized. Also, the initial symptoms and subsequent prolonged course implied a disease process referable to the hearing apparatus. Since the symptoms and signs were persistently focal in character, one would have expected that these tumors be discovered early. Such, however, was not the case, these patients complained of tinnitus or of varying degrees of deafness for long periods before the neoplasms were recognized. Could it be due to the fact that slow-growing tumors manifested themselves at a gradual rate? Or is it because physicians neglected to test the vestibular and cochlear functions?

It is possible that had caloric stimulation and hearing tests been performed in every case of "middle or inner ear trouble," more cerebellopontine angle tumors would have been discovered at an earlier period. The absence of caloric responses in an ear which is partially deaf is highly significant of tumor implicating the eighth cranial nerve. Even if there be no other signs, such a patient should be suspected of having a tumor of the cerebellopontine angle, until proven otherwise.

Most of the neoplasms in this group were of the encapsulated type, such as meningioma, neurofibroma, and non-malignant glioma. A diagnosis of tumor of the brain may sometimes be delayed because the presenting physical signs are misleading. They may indicate either a diffuse involvement of the nervous system or a falsely localizing pathological process other than tumor. One such example is cited below.

SERIES CASE No 79—B S—A fifty eight-year old painter was admitted to the neurologic service complaining of

headaches. From the age of fifteen to twenty-nine he suffered periodic attacks of severe occipital headaches. Since then he had been free of symptoms until two years before admission when the head pains returned. These headaches were located in the left frontal region and recurred daily. During the past nine months he experienced transient episodes of burning sensation in the right thigh, and on several occasions cramp like seizures in both of the thigh and calf muscle groups. Three months before admission there developed moderate pain in the left shoulder which radiated to the left hand. Since then he noticed that he was unable to differentiate objects with this hand and that it became numb.

Except for the mild peripheral arteriosclerosis and blood pressure of 150/100, the systemic examination was essentially negative. Neurologic status revealed complete astereognosis and a slight disturbance in the postural sense in the left hand. There was a positive Babinski sign on the same side. The vibratory, two point discrimination, tactile, thermal, and pain sensibilities were normal.

Spinal puncture disclosed a clear, colorless fluid under an initial pressure of 110 mm. of water. There was no block to jugular compression. X-ray of the cervical spine showed an advanced hypertrophic spondylitis.

The clinical diagnosis was "suspected brain tumor." Under observation, the patient complained of occipital headache which radiated to the left side of the neck. Sneezing, coughing, straining, or a change in the body posture aggravated the head pains intensely. The sensory disturbances in the left hand persisted, and in addition there appeared defects in two point discrimination sense and a slight dystaxia in the left finger-to-nose test. Since the clinical course was progressive, the suspicion of tumor of the brain became stronger, and an encephalogram was therefore performed. This revealed large amounts of air in the subtentorial and cortical regions, with the greatest collection of air over the right hemisphere, extending from the midfrontal posteriorly to the occipital region. These findings were interpreted as being due to a cortical

atrophy, which was most prominent in the right parietal lobe. The ventricular system was not visualized. This was considered to be due to an artifact. The patient made no improvement, and died suddenly two months later.

Necropsy disclosed a dural endothelioma the size of a walnut located at and just above the level of the foramen magnum and compressing the medulla oblongata and cerebellar lobe on the left side.

COMMENT Attacks of intense headache are unusual in cerebral arteriosclerosis, and when in addition there are physical signs pointing to a well-localized intracranial lesion, one should almost always suspect tumor of the brain as the cause of the cephalalgia. The encephalograms in this case were not those usually observed in intracranial tumor, because excessive amounts of air were observed to be present over the cerebral cortex. The cortical atrophy, the asteriognosis, and other physical signs, in the presence of vascular disease suggested cerebral arteriosclerosis as the etiology for the focal lesion in the parietal lobe, especially so when excess air was found over the right parietal lobe by encephalogram. Certainly it precluded a neoplasm in that region, despite the fact that clinical judgment prompted that diagnosis. Post mortem examination, however, proved that the localization of the lesion was erroneous. The physical signs in this patient were due to degeneration of the ascending posterior column and descending pyramidal tracts, as shown by histological examination. The pathology was found chiefly in the upper cervical cord and lower brain stem, just at the level of compression by the tumor.

As this case illustrated, it is sometimes difficult to differentiate lesions of the parietal lobe from those of the upper cervical cord. Disease of either site may yield the same physical signs. The symptoms and signs which this patient exhibited were of the type usually found in disease of the cortical sensory and motor zones, and therefore were falsely localizing. Another misleading factor was the encephalographic interpretation of atrophy of the right parietal lobe. These findings prevented the consideration

of a possible lesion in the lower brain stem. In retrospect, one may explain the encephalogram as follows: the tumor located in the vicinity of the roof of the fourth ventricle may have produced a ball valve effect: it allowed the fluid to escape but prevented air from entering the ventricles. For this reason the ventricles collapsed, and the air filling the apparent increase in the subarachnoid and subdural spaces left by collapsed ventricles produced a picture of external hydrocephalus. It is possible that the right lateral ventricle emptied more than the left, and hence when it collapsed gave an appearance of greater cortical atrophy on the right, or the picture may have been caused by a subdural collection of air and was an artifact. At autopsy there was no cerebral atrophy. On the contrary, the convolutions were distended and flattened.

GROUP VI

(Duration of symptoms from onset until first admission to hospital—more than three years)

In patients who presented histories lasting over three years, the clinical course was milder than in any preceding group. As initial symptoms, impairment of vision and convulsive seizures were foremost. It was noted that in five of the six perichiasmal tumors the complaints consisted of nothing more than an intermittently progressive failure in vision for several years. Some patients visited opticians and were fitted with glasses, and not until the eyesight became notably worse, or headache or glandular disturbances became manifest in addition to the visual disturbances, was the physician consulted. This delay in seeking the physician's advice was one reason why the slow growing pituitary tumors were not discovered until years after the onset. By the time these patients entered the hospital, all of them possessed clear cut signs of a space occupying lesion in the region of the optic chiasm.

As for convulsive seizures, they were initial symptoms in five of the seven tumors involving the cerebral hemispheres. The reasons for delay in diagnosis in these instances were the same as those discussed under Group V. The incidence of headache, when compared with the former groups, was

found to be greatly decreased. The head pains were mild and sporadic, and usually attributed to eye strain.

Papilledema was not as common as in previous groups. This reduction in percentage incidence may have been due to the presence of six perichiasmal tumors in this group which manifested optic nerve changes by atrophy rather than by edema. If the pituitary tumors had been excluded, the incidence of papilledema would have been raised to seventy-two per cent. Disturbances in visual field were common, because six of the tumors implicated the optic chiasm. Among other prominent physical signs were those afforded by lesions in the region of the cerebellopontine angle, manifested chiefly by disturbances in function of the brain stem and cranial nerves.

When there was a history of inflammatory disease of the brain and meninges, or if the symptoms developed directly after a head injury, the presenting physical signs were sometimes attributed to the old disease process, and thus the suspicion of tumor of the brain was obscured and the diagnosis delayed. This was especially true in cases in which the evolution of symptoms was slow and the clinical course seemingly showed no progression.

The following cases furnish examples in which the diagnosis of tumor of the brain was not made until years after the initial onset.

SERIES CASE No. 97—B. M.—A forty-nine year old house wife was admitted with the history of meningitis in childhood. On several occasions during the last ten years, she had had twitchings in the muscles of the left side of the neck. Three and a half months ago she had a generalized convulsion, and on regaining consciousness she noticed a weakness of the left side of her body which lasted two weeks. Since then she has had several epileptiform seizures, originating in the left foot and hand and spreading rapidly to become generalized. During the same period, momentary twitchings in the left side of her neck and also in the muscles of the left face appeared every three or four days.

Examination revealed a moody individual—at times hilarious and at times melancholy. There was a left hemi-

paresis and concomitant mild pyramidal tract signs. She made frequent errors in identifying objects with the left hand. A mild agraphesthesia was detected on the hemiparetic side. A diagnosis of brain tumor in the right fronto-parietal lobes was made, and confirmed shortly after admission by a craniotomy. The histology was that of a benign glioma.

COMMENT. The history of meningitis was a misleading factor in the interpretation of the twitchings of the neck muscles. With the latter as the only symptom for many years, it was easy to be careless and to attribute this complaint to old inflammation of the meninges. Convulsive seizures occur after a meningitic process, but not too frequently. Most significant was the strict localization of the twitching, which usually implies circumscribed cerebral pathology. In the slow-growing cerebral tumors, various forms of epilepsy were among the most frequent initial symptoms, and it was found that convulsions sometimes existed for long periods before other cerebral manifestations appeared.

SERIES CASE No. 99—N G.—A forty-two year old married man entered the hospital with the chief complaint of failing vision. He had had numerous head traumata. In 1908 he was struck by a trolley car, in 1918 he fell twenty feet from a United States druggible into a swamp, and in 1920 he was "knocked unconscious by a blackjack." Two days after the druggible accident, sixteen years ago, he found that the vision in his left eye was almost gone, this an army physician ascribed to chronic alcoholism. He drank a pint of "hard liquor" a day, and in 1921 he was in the Bellevue Hospital alcoholic ward. While there, he had a generalized convulsion. This also was attributed to chronic alcoholism. Except for the defective vision in the left eye, he was well and continued to work at odd jobs. Four months ago the sight in the right eye began to fail. This became progressively worse until finally he consulted a physician.

Examination revealed a moderately obese male who appeared euphonic. The general physical examination was

negative. Neurologic examination showed slightly broad-based gait, bilateral pyramidal tract signs, the left knee jerk slightly greater than the right, and a slight tremor of the outstretched hands. There was bilateral optic atrophy. The left eye was amaurotic, and vision in the right eye was 20/40, with the visual field showing a generalized contraction and a great tendency to temporal hemianopsia. The pupillary reactions in the left eye were those expected in a non-functioning optic nerve, in the right eye the responses were normal. The left naso labial fold was less prominent than the right.

The clinical diagnosis was suprasellar tumor.

Roentgenogram of the skull showed a slightly enlarged sella turcica, and encephalogram revealed a moderate internal hydrocephalus with defects in the left anterior horn and in the third cerebral ventricle. No definite conclusions could be drawn from these observations. The patient felt well and had no complaints except for impaired vision. A ventriculogram performed a week later revealed no new information. Since the patient hesitated to give consent for an exploratory craniotomy, he was placed on non-specific foreign protein therapy as a temporary and empirical measure. A half hour after he received an intravenous injection of typhoid vaccine there developed severe headache and he complained that his eyesight became worse. A few hours later the visual acuity became reduced to 20/200. This "reaction" gradually disappeared and within four hours he was the same as on admission. The typhoid injections were repeated and the same effects obtained. Apparently there was a definite relation between the typhoid inoculation and the subsequent prolonged reduction in the visual acuity.

Finally the patient was subjected to a right transfrontal craniotomy, and a tumor the size of a walnut was removed from the suprachiasmal region. The patient reacted poorly and died twenty-four hours later. An autopsy revealed that only a small part of the growth had been excised. There was a large cholesteatoma, "pearly tumor," which in-

filtrated the entire base of the brain and extended upward into both of the temporal and frontal lobes

COMMENT With the complicated history of numerous head injuries and of alcohol addiction, it was difficult for anyone to suspect a brain tumor in the early course of the disease. Furthermore, the patient was apparently comfortable and did not seek medical aid for years—until his “other eye went bad.” It is well known that in an individual who is addicted to alcohol, convulsions are not uncommon, but optic atrophy is rare. The presence of optic atrophy should have prompted the consideration of an etiology other than alcohol. Brain tumor, syphilis, and multiple sclerosis are the intracranial conditions which most frequently produce atrophy of the optic nerve, and these certainly should be considered despite a history of other possible etiological factors, e.g. alcohol or head trauma. Once a brain tumor is suspected, any other etiology should be excluded by all diagnostic measures available. In this way it will be possible to make an earlier diagnosis in many instances.

SERIES CASE No 100—A C—A forty-two year old housewife was admitted to the hospital with the following history. At twenty three years of age there developed frequent attacks of dizziness, giddiness, nausea, and fainting. Periodically she also complained of mild headaches. The spells were attributed to a head injury which she had sustained thirteen years previously. At the age of thirty two she was subjected to a left temporo occipital decompression (?). She improved, and for the next eight years was symptom-free. Two years ago the fainting spells recurred. Six weeks ago, vision became impaired. Three weeks ago she had a generalized convulsion.

Examination revealed bilateral papilledema with hemorrhages, generalized hyperreflexia, and a positive Babinski sign on the left. X-ray showed an old “trephine opening” in the left parietal bone.

COURSE An encephalogram was unsuccessful. Several days later the patient became stuporous, and an emergency subtemporal decompression was performed. The result was

a remarkable improvement with almost complete recession of the papilledema

She was discharged as improved, and was in good health for the next ten months, when there developed a sudden attack of unconsciousness followed by a transitory right hemiparesis. Examination on the second admission revealed papilledema of $1\frac{1}{2}$ D in each eye, and a positive Babinski on the left and occasionally on the right. Smell was impaired bilaterally. Under observation, she had a generalized convulsion. An encephalogram this time revealed normal ventricular and subarachnoid systems. Since the suspected tumor could not be definitely demonstrated, the patient was discharged to the follow-up clinic. There she was observed for two years. She continued to have convulsive seizures every three months, and they usually occurred after a quarrel with her husband. There was no change in her condition except that during the last year there was noted a progressive impairment of memory.

When she was admitted a third time, the only objective signs were a slight blurring of the right optic disc margin and impairment bilaterally of the sense of smell, as on previous examinations. A third encephalogram showed a questionable shift of ventricular system to the left. More significant at this time was the visualization of a shadow interpreted as a calcification in the right subfrontal region. Based upon the latter finding, the right frontal lobe was explored and a hemangiomatous tumor involving two-thirds of the prefrontal lobe was excised.

COMMENT This and many of the previous cases illustrate the perplexities encountered in the diagnosis of tumor of the brain. It was difficult to understand the existence of choked discs in the presence of a normal ventricular and subarachnoid system. Despite the fact that the patient had had bilateral subtemporal decompressions, changes in the ventricular system, especially anteriorly, must have occurred since papilledema existed. From this example, it is evident that normal encephalograms may be found during the symptomatic period of tumor of the

brain * Such observations may be expected usually early in the clinical course. Since, at the present time, more cases of tumor of the brain are suspected earlier in their course, and since more aerograms are used in the study of intracranial disease in general, it is probable that more examples of normal encephalograms in the presence of verified expanding intracranial lesions will be noted. In such instances the diagnosis of tumor of the brain will depend upon clinical judgment.

In this case, the excessively long remissions in symptoms, the absence of headache, the paucity of physical signs, and the negative an studies, all tended to preclude an expanding intracranial lesion, although clinical judgment prompted what proved to be the correct diagnosis. The slow, protracted, and intermittent course was due more likely to the hemangiomatic nature of the growth. The absence of physical signs may be explained by the fact that the tumor was located in one of the "silent" areas, the right prefrontal lobe.

GENERAL COMMENT

The symptomatology of any type of intracranial tumor is extremely variable. Cerebral manifestations, ultimately present in most instances, vacillate in every case, especially in the incipient stages of the disease. The well defined and clean cut syndromes of brain tumor, as expounded in text books, are descriptions of symptoms and signs found usually in the advanced stages of the disease, when the cardinal signs of an expanding intracranial lesion are obvious and the diagnosis is simple.

The further back the clinical history is considered, the more difficult becomes the task of evaluating symptoms, particularly if there be an isolated complaint which may be common to many diseases. The difficulty becomes more pronounced when there is a lack of objective signs. Hence, the general practitioner who sees a large cross section of

* In this series of 500 patients with verified tumor of the brain, there were five cases in which the pneumoroentgenogram was reported to be normal, and yet, despite negative results, exploratory craniotomy in each case revealed a tumor.

clinical material is not to be blamed if he overlooks the presence of a brain tumor. If, indeed, he suspected the existence of one, he is to be congratulated, because early in the clinical course the consultant may be just as puzzled as the referring doctor.

From perusing the tables, it can be gathered that when the manifestations of tumor of the brain are mild and develop slowly, the chances are that the tumor will be histologically benign. As a corollary, it may be repeated that when symptoms are moderate, the diagnosis is difficult, and consequently the symptomatic period will be prolonged. Therefore, in order to shorten this period, it is necessary to reduce the difficulties involved in the detection of the disease. This can be accomplished partly by more detailed and frequent studies of the early course of tumors classified in the last three groups. And such labors will not be in vain, for not only will they improve the clinical acumen of the physician but, better still, therapeutic results will be more encouraging, since these tumors are usually of the benign encapsulated variety and do not tend to recur.

To give a detailed analysis of brain tumor, symptom by symptom, would mean to encumber this communication with a mass of approximate figures. Therefore, mention will be made of only a few of the more common primary manifestations. In all groups, the most frequent initial complaint was headache, and certainly from this observation it may be considered as an early rather than a late symptom. The headaches of brain tumor are subject to many confusing variations, and no rule can be laid down to make them characteristic. When headache is the only complaint, and unaccompanied by other manifestations or physical signs, it is indistinguishable from the role it plays as a primary symptom of other diseases. Therefore some of these patients were treated for sinus disease, for refractive errors in vision, or for "constipation," until a new sign or symptom called the doctor's attention to the fact that the underlying process was intracranial.

Whereas headache may be a symptom of disease elsewhere than in the central nervous system, convulsions as

a rule are due to disturbance in intracranial function. A frequent cause of convulsions is cerebral neoplasm. Because these seizures occur chiefly in patients with supratentorial tumors,* they have some localizing value, and when they are Jacksonian in type the lesion may be further localized to the region of the motor cortex.**

Other symptoms which have even more localizing significance are unilateral tinnitus, impairment of hearing, of vision, of speech, of motor power, and of sensibility. Of these, only aphasia, motor weakness, and diminished sensation were found to be primary symptoms in cases with short histories. This does not necessarily imply that these symptoms were responsible for an earlier diagnosis. It may have been due to the fact that they occurred in rapidly growing neoplasms, in which other symptoms such as severe headache appeared almost simultaneously, and together these symptoms forced the patient to seek medical aid earlier than the individual who was suffering with a slow growing neoplasm. In other words, it was the nature and rate of growth of the tumor, with proportional symptomatic expression, and not the local value of the initial complaint, which led to an early discovery of the disease.

On the other hand, when either tinnitus or blurred vision was an initial symptom, the duration of the disease was found to be prolonged, because the organism had sufficient time to accommodate to the changes produced by such slow growing space occupying lesions as acoustic neuromas or pituitary tumors. In these instances the patient did

* Convulsive seizures or their equivalents were found to be present during the course of the disease in more than one third of 380 patients with tumor located above the tentorium. In a series of 120 patients with tumor located beneath the tentorium, 16 individuals showed some form of epilepsy. Of these, 7 had Jacksonian epilepsy, and in 2 patients the Jacksonian convulsions were initial symptoms and therefore were falsely localizing and misleading in the diagnosis of location of tumor.

** While epilepsy or its equivalent is important as an attention calling symptom and theoretically would be expected to help toward an early diagnosis, such was not the case. It was noted that as a primary symptom, convulsions were common among the late, rather than among the early, recognized tumors. (See Table II and Fig. 1.)

not appear ill, the symptoms were mild, and often the physician was either not impressed with the objective signs, or they were overlooked. The great errors sometimes committed in these cases were neglect to examine fundi, to plot visual fields, or to test the vestibular or cochlear functions. The difficulties encountered when these examinations were made, were in the evaluation of mild disturbance in function, as for instance in the interpretation of early optic atrophy or impaired caloric responses. Undoubtedly these errors may be remedied by more frequent fundus and vestibular examinations. In this fashion the doctor will have a more lasting impression of what the normal is like, and thereby help to improve his clinical sense. If the practitioner is too busy for such detailed investigation, or if he is not sufficiently experienced to evaluate ophthalmoscopic or other observations, he should consult the specialist and demand of him a thorough examination of the eye and ear functions of the referred patient.

Mental changes occur sooner or later in the course of most patients with tumors located above the tentorium, and less frequently in patients with tumors located below the tentorium. As initial symptoms, mental changes were found more commonly in patients with supratentorial tumor whose histories were of brief duration and were usually to be associated with other symptoms. Mental changes, when unaccompanied by physical signs other than those of intracranial hypertension, had localizing value insofar that they were more apt to be found in patients with tumor above rather than below the tentorium. This was especially true in those cases in which mental disturbances were primary manifestations.

As an initial symptom of brain tumor, vomiting was found to be uncommon. It usually occurred in advanced stages of the disease and was a frequent late symptom. When vomiting was persistent, wasting and loss of weight appeared as sequelae.

The symptoms during the course of a tumor of the brain are described in many text books as being progressive in character. In this study, such was frequently not the case.

the course was found to be characterized often by long remissions, during which period the patient was some times free of all subjective and objective manifestations. Complete regressions of hemiplegias, papilledema, aphasia, or other objective signs were observed in many patients of this series. In some instances, the clinical course was similar to that of cerebral thrombosis or of encephalitis, where improvement in symptoms is the rule. During the stage of improvement in a patient with tumor of the brain, the physician may be disinclined to regard the case as that of intracranial tumor, and label the disease as "vascular" or "inflammatory" simply because the patient recovered from his attack of cerebral symptoms. It must be reemphasized that remissions in symptoms in patients with tumor of the brain are common, and therefore, when an improvement in signs or symptoms does occur in the course of the disease, it should not be argued that because of the improvement the diagnosis of tumor is not likely.

A majority of the patients had at least one or more physical signs when admitted to the hospital, and in many cases the signs were adequate for localization. In those in which the tumor could not be localized, aerograms were of great aid. When physical signs were lacking, the diagnosis was invariably postponed until pneumoencephalogram proved the existence of a tumor.

There is no point in discussing the characteristics of every abnormality noted in the examination made on admission to the hospital. The only textbook objective manifestation of tumor of the brain which needs special comment here is choked disc. All of the patients but one had eye ground examinations. Forty eight per cent of them showed papilledema of different intensities—some, early swelling, others, advanced choking with secondary optic atrophy. The incidence among twenty three patients with intratentorial tumor was fifty-six per cent, and among seventy-seven patients with supratentorial tumor it was forty five per cent. These figures illustrate that the incidence of papilledema in tumor of the brain is not as

common as it once was thought to be.^{*} From the foregoing, it is evident that papilledema is not a necessary criterion for a diagnosis of brain tumor. The decreased percentage in papilledema is probably the result of earlier clinical diagnoses. Undoubtedly, the more frequent use of aerograms decreased the duration of the clinical course in many suspected cases. Our conception of the symptoms of tumor of the brain must be changed from the classical descriptions, where the emphasized symptoms are those found in advanced cases. When more tumors of the brain will be discovered sooner, naturally their symptom complexes will change, the syndromes will be descriptions of the disease at a period earlier than they have been described. In this way, the physician will train himself to make still earlier diagnoses. Aerographic study will require most delicate interpretation, indeed, the encephalogram may even appear normal, and in spite of the negative pneumoencephalograms of the skull, the keener clinical sense will espy the presence of an intracranial tumor.

It will be seen from this study that there is no classical syndrome of tumor of the brain. There is no one symptom upon which stress can be laid in making the diagnosis. The diagnosis depends entirely upon the physician's ability to weigh the severity and nature of the symptoms in each individual case, upon his keenness in detecting objective signs—no matter how slight, and to appreciate their importance in connection with the subjective complaints of the patient. If a diagnosis cannot be made, there then must follow a period of careful observation and the use of physical methods, such as encephalography, to either substantiate or disprove the presence of tumor. It may also happen that even these laboratory methods may give negative results, and despite this the progress of symptoms both subjective and objective may lead to the diagnosis of a cerebral neoplasm, and warrant surgical interference at

* In support of this statement, a study of a series of 500 verified tumors of the brain revealed that the percentage of choked discs among all types of intracranial tumor decreased each year from 1915 to 1935, and that the greatest decrease occurred in the last three years.

an early stage. In other words, the diagnosis of a cerebral neoplasm depends even today upon the ART OF MEDICINE, assisted by whatever laboratory procedures are available.

SUMMARY

A review of the initial symptoms and early course of the last one hundred of a series of five hundred patients with tumor of the brain revealed the following:

- 1 Headache, mental changes, and disturbances in mental speech (aphasia) were the most frequent primary symptoms in patients with rapidly growing tumors; these symptoms were severe and disabling, attracting the early attention of the patient and the doctor and therefore pre-disposed to the recognition of the disease shortly after its onset.

- 2 Convulsions and visual disturbances were the most frequent primary symptoms in patients with slow growing tumor; these symptoms were usually mild, transitory in character, and unaccompanied by other symptoms, and hence the tumors in these instances were not discovered till late.

- 3 The course of the disease was frequently characterized by partial or complete remissions in subjective as well as objective symptoms.

- 4 Papilledema was found to be present in forty eight of the last one hundred patients studied; in thirty five of the seventy seven patients with supratentorial tumor, and in thirteen of the twenty three patients with infratentorial tumor.

- 5 The incidence of occurrence of papilledema was found to be high among patients with clinical histories of relatively long duration, and low among the cases with brief duration, because in many of the latter the tumors were recognized before papilledema appeared.

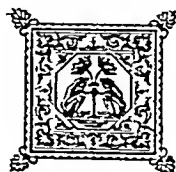
- 6 There was a progressive decrease in the percentage of incidence of papilledema among patients with verified intracranial tumor admitted each year from 1915 to 1935, the greatest decrease occurring in most recent years. This observation may be explained by a wider and more frequent

use of pneumoroentgenograms, leading to an earlier diagnosis of tumor of the brain in general—before the appearance of choked disc

7 The more frequent recognition of tumor of the brain earlier in its course will change the older text book descriptions of symptom complexes observed late in the course of the disease to the newer descriptions of syndromes observed earlier in the disease

8 Normal encephalogram during the course of a tumor, later verified by operation or necropsy, was found in five instances

9 Several case histories were cited to illustrate the various problems encountered in the early diagnosis of tumor of the brain. The correct diagnosis in most instances depended upon clinical judgment, aided by whatever laboratory procedures available



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CARCINOMA OF THE COLON AND RECTUM*

DANIEL FISKE JONES, BOSTON

While progress in surgery of the colon and rectum has been slow, the attitude of the physician and surgeon is much better than at my first appearance in New York some twenty years ago. The first time I talked here I suggested that a colostomy should be done for all operable cases of carcinoma of the rectum. This was frowned upon by the majority of those present, and several surgeons who spoke to me after the meeting said that they had cases alive fourteen years or more after removal of the growth without a colostomy. When asked what operation had been done, each one said that it had been a local excision. At the present time it is quite possible to suggest to a group that a colostomy should be done without being mobbed. At the meeting of the Southern Medical Association in November, 1935, Dr Rankin read a paper on the importance of a colostomy as a palliative measure in several benign conditions, and, strange to say, no one rose to object and the whole audience seemed to agree to it.

We have heard many times that this change of attitude is due to the new method of doing a colostomy which makes it so much more comfortable for the patient. I know of no operation, however, which will control the bowel. The only reason for this belief is that a few surgeons recognize the importance of teaching the patient how to control the bowel with diet and enemata so that the patient need wear nothing over the colostomy but a piece of gauze. It must be remembered also that a colostomy with removal of the growth gives the patient both physical and mental relief, while a colostomy without removal of the growth gives no mental relief and only partial physical relief.

* Read before a Stated Meeting of The New York Academy of Medicine arranged in cooperation with the Section of Surgery, February 6, 1936

As to etiology, I have nothing to suggest as to the cause of carcinoma of the rectum or colon other than adenomatous polyps. A large percentage (E G Martin* says from 40 to 60 per cent) become malignant. To make a diagnosis of adenomatous polyp is therefore much more important than to make a diagnosis of carcinoma. That is, it is much better to cure 60 per cent permanently with a low operative mortality than to cure 20 out of each 100 cases seen, for five or more years.

I am sorry to say that improvement in diagnosis has not kept pace with the improvement in the general attitude toward and the surgical technique of these cases. Because there is very little interest shown in the disease, the diagnosis is usually made very late if at all, and yet all that is necessary for the patient and family physician to know is that any change in bowel habit or sensation with blood in the stool, or either of these symptoms alone, suggests carcinoma of the colon or rectum.

While I do not expect the physician to make a diagnosis of carcinoma of either the colon or rectum, he should be quick to recognize the early suggestive symptoms in order that the patient may be sent to the proper person to make a diagnosis. I would prefer that the physician did not even make a digital examination, as I agree with Dr E G Martin who says that 75 per cent of the medical profession fail to make a proper digital examination, and an examination which does not get up to the recto-sigmoid junction or near it is worse than valueless. One should also be able to recognize occasionally by digital examination a carcinoma of the sigmoid which has fallen into the pelvis and also nodules on the anterior wall of the rectum on the peritoneal surface which are metastatic nodules from growths in other organs.

For those who must make a diagnosis, after a proper digital examination has been made, a proctoscopy should be the next procedure, and again I am sorry to say that much of the value of this instrument is lost because a great

* "Predisposing Factors and Diagnosis of Rectal Cancer" *Annals of Surgery*, July, 1935

deal of the evidence that can be obtained by it is not used. It is possible to see 22 cm from the external orifice when the bowel is pulled up into a straight line. This should be properly inspected for the whole distance. Blood in the ampulla is usually due to hemorrhoids or something in the ampulla, while flecks of blood seen above the ampulla indicate bleeding from above and must be accounted for. Surgeons not infrequently see such conditions as colitis and chronic ulcerative colitis which are not present and hence there is delay in the diagnosis of carcinoma, which is frequently the real condition present. A frequent site for polyps and carcinomata is on the anterior wall at about 15 cm, which is just above a fold of mucous membrane. When the patient is in the knee chest position this is frequently overlooked, because in the effort to get above the fold one is likely to cover the growth with the proctoscope. This can be avoided by inspecting the whole rectum carefully as the proctoscope is withdrawn. If one cannot get the proctoscope up to 22 cm he should know the reason why. One should not feel disappointed if he cannot always see the surface of the growth when it is present, for it frequently makes an acute angle in the bowel so that it is impossible to see the growth. There is no law against using the proctoscope to feel with.

These two examinations, digital and proctoscopic, should make the diagnosis in 100 per cent of the cases in which there is a growth present. Why, therefore, should we use the x ray until it has been definitely proved that there is no growth in the rectum? I appreciate that I am foolhardy, but I am going to repeat what I said the last time I spoke in this hall, and that is that the average roentgenologist does not make a diagnosis of carcinoma of the rectum in over 40 per cent of the cases in which it is present. I was taken to task for this statement when I first made it, and yet within a week of that time I saw a patient who came from within a radius of eight miles of this hall, who had had two x ray examinations several months apart and had been examined digitally by three men without the carcinoma being found. The growth could be reached easily with the

As to etiology, I have nothing to suggest of carcinoma of the rectum or colon other than polyps. A large percentage (E. G. 40 to 60 per cent) become malignant. The removal of an adenomatous polyp is therefore much more than to make a diagnosis of carcinoma. It is better to cure 60 per cent permanently than to cure 20 out of each 100 or more years.

I am sorry to say that improvement has not kept pace with the improvement in the surgical technique. There is very little interest shown in early diagnosis. Diagnosis is usually made very late if necessary for the patient and fatal. It is not until there is a change in bowel habit, in the stool, or either of these symptoms that a diagnosis of carcinoma of the colon or rectum is made.

While I do not expect the physician to be quick to recognize the early signs, I think that the patient may be seen early enough to make a diagnosis. I would prefer to make a digital examination. A physician who says that 75 per cent of patients fail to make a proper digital examination which does not get to the point where it is worse than no examination. It is not possible to recognize occult carcinoma of the sigmoid colon and also nodules on the peritoneal surface. It is not possible to recognize growths in other organs.

For those who are not able to make a digital examination, I think that the next procedure would be to make much of the value of the

* 'Predisposing
Surgery, July, 1910

as an aid to determining as to whether or not to operate Rankin says that groups III and IV are sensitive to radiation and that radiation may give better results than surgery when the growth is far advanced. Gabriel of London believes that highly malignant growths, such as the colloid growths, should not be operated upon because, he says, the hope of cure is quite remote. I myself do a biopsy only when there is some doubt as to the diagnosis. As I believe that it is impossible for the pathologist always to grade growths accurately, and as he may put a group II growth into group III or IV, I prefer to operate upon all patients who are capable of standing the operation, regardless of the type of growth, with the hope that I may get five or ten year cures in some and relieve others for a period of six months or more. It is my rule to remove any growth which can be removed without leaving macroscopic growth, and in $\frac{1}{4}$ per cent of the cases even when metastatic growths are present in the liver.

There are many statements which tend to discourage the operator. For example, it is stated that if metastatic glands are present, cure is impossible. In spite of this, many cases with metastatic glands live for five years or more. A recent report from a patient who had carcinoma of the sigmoid, with the mesentery filled with growth and with the growth adherent to a tube and ovary and to the mesentery of the small intestine, shows that the patient is alive

and well without evidence of recurrence after ten years. Four per cent of my cases have been operated upon in spite of what were believed to be metastatic nodules in the liver. One lived and worked four and a half years and died of carcinoma of the liver, while a report came a few days ago from a man supposed to have had the whole surface of the right lobe covered with small nodules, 0.5 to 1 cm. in diameter, who is alive and well at the end of five years after operation. This was quite evidently an error in diagnosis.

As to the operation to be used, I prefer the most extensive operation that you can carry out on the particular individual under consideration. There are many opinions as to what that operation should be, but it is generally accepted

TABLE I—*Totals of Patients Seen, Operated Upon, and Total Mortality*

Total number of patients seen	672	
Total number of radical operations	427	
Percentage of operability	63.5%	
Type of operation		
Combined abdomino-perineal, 1 stage	167	39%
Combined abdomino-perineal, 2 stage	110	25.7%
Combined abdomino-perineal, sphincter preserved	21	4.9%
Colostomy and posterior excision	114	26.7%
Abdominal excision and colostomy	15	3.5%
Mortality of all groups	81	18.96%

TABLE II—*Total Number of One and Two Stage Combined Abdomino-Perineal Operations*
Hospital and Private

	Total No Cases	Mortality	Operated 3 yrs +	Lived 3 yrs + (Operative mortality excluded)	Operated 5 yrs +	Lived 5 yrs + (Operative mortality excluded)
Combined abdomino-perineal, 1 stage	167	13%	143	72.2%	111	52.6%
Combined abdomino-perineal, 2 stages	110	27%	107	61%	106	51.3%
<i>Private</i>						
Combined abdomino-perineal, 1 stage	135	11%	111	76.8%	80	56.5%
Combined abdomino-perineal, 2 stages	51	17.6%	48	67.5%	47	61.5%

TABLE III—*Colostomy and Posterior Excision*

	Total No Cases	Mortality	Operated 3 yrs +	Lived 3 yrs + (Operative mortality excluded)	Operated 5 yrs +	Lived 5 yrs + (Operative mortality excluded)
Private	75	13%	57	50%	51	33%
Hospital and Private	114	19%	96	50.6%	90	37.7%

that it is the combined abdomino-perineal operation in one stage as introduced by Czerny in 1883 and popularized by Miles in 1912. While I believe that to be the ideal operation, which should be carried out on every patient when it is reasonable, there are patients who are not able to stand

it when it is done by the individual who is to operate. We should therefore have in our armamentarium at least five operations. These are

- (1) Combined abdomino-perineal excision of the rectum in one stage
- (2) Combined abdomino perineal excision of the rectum in two stages
- (3) Combined abdomino-perineal excision of the rectum with preservation of the sphincter
- (4) Colostomy and posterior excision of the rectum
- (5) Abdominal excision of the rectum with a colostomy

It is unfortunate that I described a two stage operation which I advised for patients in poor condition and those over sixty years of age, and I still advise it for beginners in such cases. While I used it on nearly 50 per cent of my cases in the beginning, its use has gradually decreased as my experience has increased and in the last 5 years I have done but 4 combined abdomino-perineal operations in two stages, while in the same period I have done 54 combined abdomino perineal operations in one stage. In spite of this I am still accused of doing nothing but a two stage operation.

Miles did much work on the lymphatics of the rectum, showing very definitely the value of his abdomino perineal operation. The statement made years ago by Hausman to the effect that glands were involved in only 50 per cent of the cases dying of cancer of the colon is apparently still believed by some even at the present time. It would take very little thought, however, to realize that this statement could not be proved to be true, for if it were, we should permanently cure at least 50 per cent of those who come to us, while as a matter of fact the average percentage of those operated upon is not more than 30 per cent and of these not more than 5 per cent are permanently cured. Verdin says that it is useless to attempt a radical dissection of the pelvis because of the lymphatics running from the rectum to all the other organs in the pelvis. This is a broad statement which cannot be proved, for I have never

seen the bladder, seminal vesicles, ovaries, or tubes involved except through contact. Besides this, there are many five year cures even when glands are present at the time of operation.

Miles' operation as modified by myself consists of a dissection of the pelvis after peritoneal flaps on both sides of the rectum and lower sigmoid have been freed. A peritoneal flap is turned up anteriorly and the dissection carried well down on the vagina or to beneath the seminal vesicles. Beginning with a freeing of all tissue from the iliac arteries, a line of cleavage is entered beneath the pelvic fascia which is carried down posteriorly and laterally to the levatores ani, leaving the lateral attachments of the rectum. The ureters have been exposed to avoid injury. The rectum is now pulled up and the lateral attachments cut and the anterior and posterior dissections joined. The superior hemorrhoidal is now tied below the left colic and the dissection carried up to the sigmoid which is double-tied and sectioned. Rubber dam is tied over the ends and the distal end put deep into the posterior portion of the pelvis. The pelvis is then covered with peritoneal flaps, which can be done easily if the peritoneum is well freed at both sides of the bladder where it is held down firmly. The proximal end of the bowel is brought out the left paramedian incision for a colostomy. The sigmoid from its attachment to the lateral abdominal wall to the colostomy is sutured to the lateral and anterior abdominal wall to prevent the small intestine getting between this loop of bowel and the abdominal wall. No sutures are put in the colostomy.

The patient is now put into the reversed Trendelenburg position. An incision is made about the anus and the anus closed with a silk suture. The dissection is then carried upward and all the ischiorectal fat and the levatores ani close to their attachments are freed. The dissection is carried as far away from the bowel as possible into the dissection above. I have found it an aid to cut through the fascia covering the rectum laterally and carry the dissection to the prostate. This gives a landmark which

is an aid in freeing the rectum from the perineum to the prostate, a dangerous region

The modifications of Miles' operation are first that Miles does not remove the pelvic fascia and therefore does not remove the presacral nerves, and second that he does not dissect up peritoneal flaps to make the pelvic floor and in consequence does not remove all the pelvic fat. For this reason he has difficulty in covering the pelvis. In the posterior portion of the operation Miles carries his dissection at once into the upper dissection posteriorly and pulls down the end of the bowel, freeing it by cutting close to the bowel laterally as it is pulled down. This method of removing the rectum is undoubtedly responsible for the complete absence of bladder paralysis and bladder complications which Miles reports, as the dissection is carried close to the bowel and avoids the filaments from the second, third and fourth sacral sympathetics.

The combined abdomino perineal excision of the rectum in one stage may be reversed to a perineo abdominal excision of the rectum as recommended by Willard Bartlett, Rankin, and Gabriel of London.

The combined abdomino perineal operation in two stages is carried out exactly the same as the one stage operation until the whole pelvis has been dissected and the peritoneal flaps are about to be sutured over the pelvis. It is then decided as to whether the operation is to be in one or two stages. If it is to be in two stages, the superior hemorrhoidal artery is tied below the left colic and the mesentery incised from this ligature up to the arches from the left colic artery. Instead of the sigmoid being sectioned at this point, more sigmoid is brought down until the incision in the mesentery can be placed in the pelvis beneath the peritoneal flaps which are to be sutured about the bowel. The sigmoid is brought into the wound for a double barrel colostomy, great care being taken not to injure the vascular arches of the bowel. With a sufficient blood supply to the bowel in the pelvis it is possible to postpone the second stage from one to four weeks if necessary. The second stage of the operation is exactly similar to the posterior portion of

the single stage except for the fact that the sigmoid must be double clamped just beneath the peritoneum. The proximal end may be inverted or simply tied.

The very definite objection to this operation is that the proximal end will undoubtedly open into the pelvic cavity in a large proportion of cases and delay the healing of the pelvic cavity indefinitely. It will heal in every case, however, unless there is a foreign body or malignant disease present.

T. E. Jones* says that a two stage operation is an error, and that this is evident from the fact that the mortality of the first stage added to the mortality of the second stage makes the mortality for the one and two stage operations equal. It is true that two and two make four, but it is not true that the mortality of 20 per cent for the two stage operation on those cases selected for a two stage operation is equal to the mortality of a one stage operation on those same cases, for we do the two stage operation only when we feel sure that a one stage operation would give a mortality of 50 per cent or more. In fact, while I was away during the war one of my juniors, who did not approve of the two stage operation, tried doing only the one stage operation, and as a result had a mortality rate of over 50 per cent.

The decision as to whether to operate or not depends upon the policy of the surgeon, his experience, judgment, and surgical ability. I would much prefer to have the surgeon do a smaller operation if he is not familiar with the combined abdomino-perineal operation or if the patient is not in sufficiently good condition to stand the larger operation, than to have him do no operation at all.

In presenting the results of my radical operations I wish to point out that unless some standard method of presenting statistics is adhered to, they can be of little value. It is useless to state that one's mortality is 7 or 10 per cent unless it is stated at the same time that 25 per cent of the patients seen are operated upon.

* T. E. Jones, "The One Stage Abdomino-perineal Operation for Carcinoma of the Rectum," *Annals of Surgery*, July, 1935.

ADDRESS OF DR D BRYSON DELAVAN
DELIVERED IN PART
AT THE DINNER GIVEN HIM BY THE
NEW YORK LARYNGOLOGICAL SOCIETY
ON HIS 86TH BIRTHDAY

May 1st, 1936

Mr President and Gentlemen, Members of the New York
Laryngological Society

I am greatly honored this evening in your hearty congratulations upon the attainment of this, one of the best of many happy birthdays. Indeed, it fittingly marks the close of a perfect day, beautifully crowning its predecessors. As a feature of the occasion, Mr President, you have asked me to offer a toast to the Society, and in doing so to be the first to initiate our new and beautiful loving cup.

In offering this toast it is due to history and to ourselves to divide the salutation into two separate parts. The first should be, to the City of New York, the second, to the Society itself.

If you should ask why, let me recall that this City of New York was the veritable birthplace of laryngological science, for, nearly a century ago, in 1846, that great physician, Horace Green, discovered *the tolerance of the larynx to the presence of a foreign body*. He then developed the subject of the treatment of the throat and larynx to such an extent that Clinton Wagner has truthfully said, if the laryngoscope had never been discovered, the methods of Horace Green would in themselves have founded a Department of Medicine. The ideas propounded by him were instantly appreciated abroad, he was universally acclaimed there the "Father of Laryngology."

Many years later the discovery of the CONTINUED tolerance of the larynx to the presence of a foreign body and the many contributions to laryngological science which have been the outgrowth of this—from Intubation to Bronchoscopy—was the idea of Joseph O'Dwyer, of New York.

About the same period, 1846, the renowned surgeon of his time, Gurdon Buck, also of New York, announced that in cases of edema of the larynx he could palpate the parts, locate the points of swelling, and then, with a curved knife of his own invention thrust into the larynx, carefully guided by his finger, scarify the swellings and thus draining them of watery secretion restore the lumen of the larynx and save the patient's life. This, together with various improvements in the operation of Tracheotomy, caused our friends abroad to entitle Gurdon Buck, "Father of Intra laryngeal Surgery." Let us say again, these distinguished men were of this City of New York.

These two basic events called lively attention to the subject of diseases of the throat in general, as well as to the place of their discovery.

Meanwhile, various attempts were being made to demonstrate the interior of the larynx. None of them, however, was realized until Czermak of Budapest, Turck of Vienna, and later, Morell Mackenzie of London, appreciated the happy accident by which Manuel Garcia, the great master of vocal music, had solved the question. They entered the lists with enthusiasm, Czermak to perfect a laryngoscopic apparatus somewhat as we now know it, and Turck, together with Morell Mackenzie, to be the instructors of those who became the teachers of the world in general, some of whom taught us here, in America.

Soon the best of our young men went to Europe to study the new art at first hand, some to Vienna to learn of Von Schroter, successor to Turck, some to Paris to learn of Fauvel—others to be instructed by the great Morell Mackenzie of London. Many studied under all three. By 1873 the number of men in New York familiar with the modern methods of examining the throat and nose could easily be counted, they were of fine intelligence and education, however, and enthusiastic in the new knowledge. Among them, Dr. Clinton Wagner was undoubtedly foremost. He had led a brilliant career as Surgeon in the United States Army during the Civil War and, resigning from Military Service,

passed two years in studying Laryngology abroad and had returned to establish himself in this City.

Recognizing the situation and the possibilities for the advancement of the specialty, he had in that year, 1873, originated the Metropolitan Throat Hospital, the first institution in this country to devote itself exclusively to diseases of the throat and nose.

In October of the same year, 1873, he called together a group of the leading specialists of New York to organize a Society, not only for mutual improvement and the advancement and enlargement of their limited knowledge of the subject, but for the purpose of establishing on a solid footing with the medical profession at large the specialties of Rhinology and Laryngology in this country, for the reason that many physicians of the time looked askance at all specialties. Several who were present at that first Meeting had studied abroad and all were connected with clinics for diseases of the throat. At subsequent meetings, cases of special or unusual interest were sent, examined and discussed by those present, all of whom were young, hard working and ambitious, determined to make successful careers. Not all of the nine who organized the Society continued to follow the specialty. Those who did, succeeded to the full measure of their expectations. They were Doctors Bosworth, Lefferts and Asch. Doctors Woolsey Johnson and Bridge did not long survive, while the others, Charles McBurney, Robert Fulton Weir, Matthew D. Mann and Francis Kinnicut sought a broader field for their abilities in general surgery or medicine and soon became distinguished.

By far the most interesting feature of the existence of the New York Laryngological Society is that it was *the very first Society of Laryngologists in any part of the world*. Five years later, its success had become so well known in the United States that a National Society of Laryngologists was proposed by Dr. Frank Davis of Chicago, and at a formal meeting of the leading specialists of the country, held in Buffalo, New York, on June 3rd, 1878, the American Laryngological Association was brought into existence.

Not until ten years later, or fifteen years after the birth of the New York Society, was the fine idea of Dr Wagner followed abroad, when, in 1888, Dr Morell Mackenzie founded the British Laryngological Association. This included the most eminent specialists of the United Kingdom, and was by far the foremost organization of its kind that Europe has produced. Thus, the original idea of Dr Clinton Wagner antedated its first practical acceptance by the world at large by fifteen years. Not the least, therefore, of the many important claims of the New York Society is its unquestioned *priority* over all others. Of this, we, its present members, may justly be proud.

Verily, New York City has been "the Birthplace of Laryngology." It well deserves the title!

The New York Laryngological Society, thus founded and successfully organized by Dr Clinton Wagner more than sixty years ago, pursued a highly successful career for more than ten years. Its members were among the pioneers of Laryngology, not only of New York but of the world. By degrees it included the leading workers in the specialty in and around New York City. Among these were William Chapman Jarvis, a young man of great ingenuity and broad concept, who made many valuable contributions, as, for instance, the incomparable "Jarvis Snare." Thomas Rushmore French, of Brooklyn, distinguished for his work in general and especially for being the first and the best to photograph the interior of the larynx. For this he ingeniously devised special means, and also evolved many correct ideas as to the physiology of the human voice. John Orlando Roe, of Rochester, N. Y., notably proficient in the specialty, but preeminently a pioneer in his mastery of the surgery of the interior of the nose. George Morewood Lefterts, renowned as a brilliant teacher, pioneer and bibliographer, not to mention Fluhner, who gave the initial idea of the spray atomizer and Luis F. Sass who perfected it and revolutionized the method of making applications to the throat by means of the probang and brush, as taught by Horace Green and employed universally here and abroad.

There were others of more or less fame, all residents of New York

I became a member of the Society in due time, and, therefore, can speak from personal knowledge of the value and the continued excellence of its sessions. The last important meeting was held at the fine house of the President, Dr Rufus Platt Lincoln, in 1883, its special object being the reception and entertainment of Dr Morell Mackenzie of London, who offered an interesting paper on "Hemorrhage after Tonsillotomy", this was also my own first appearance in discussion

The discovery of new facts and the invention of useful methods and instruments was not the only function of the Society. Novel ideas were brought before it and freely commented upon by those whose opinions were of tried and practical value

For example, Dr Bosworth was busily engaged in the preparation of his masterly treatise on the "Nose and Throat." Having reduced to manuscript, tentatively, his ideas upon a certain subject he would artfully introduce that subject for discussion at a meeting of the Society, fortify or amend his views as his own good judgment dictated and then rewrite the chapter for final publication, having secured for it the best obtainable criticism. This careful and broadminded preparation was one of the factors which contributed to the marked success of his work. He was the first to recognize and call attention to the importance of the nasal region as influencing abnormal conditions of the upper air passages

As the older members of the Society passed away, and just forty years ago, after a continuous existence of great usefulness in the advancement of Laryngology and an uplifting influence in the education and enthusiasm of its members, it was merged, in 1886, into the Laryngological Section of the Academy of Medicine, at the suggestion of Dr Abraham Jacoby

The Society has been singularly unfortunate in the general misunderstanding of its particularly meritorious

career Long ago a Laryngologist of foreign extraction and then but few years resident in this country, furnished an article upon "Laryngology in America" for especial distribution in Germany He knew nothing about the original Society, or of the distinguished men composing it, still less about its history and the important part it had played in the early progress of the art His article was translated as saying, "This Society was of little importance and soon passed out of existence"* Dr Jonathan Wright, in his book upon "The Nose and Throat in Medical History," gives it scant notice Quite recently, in an article upon "Laryngology in America" presented before the British Medical Association at one of its Annual Meetings, the same entirely misleading statement was advanced

It is my earnest desire to confute this careless and erroneous idea, originally advanced in unpardonable ignorance Let me place on permanent record, therefore, the actual history of the New York Laryngological Society, for I was intimately acquainted with its founder and his intentions, and with its early members, as well as actually a Fellow of the Society itself

After flourishing with great usefulness to its members, and with not a little influence in the progress of Laryngology for more than *Ten Years*, the Presidency of the Society was secured by a then recently admitted member, of alien birth and sympathy, who failed to call the usual succeeding Annual Meeting for the election of officers and while thus retaining his position as President, died The Book of Minutes of the Society, carefully compiled by the various Secretaries from the time of the initial Meeting in 1873 and exhibiting a complete history of all pertaining to

* Many years later the same writer published in the *Zeitschrift für klinische Medizin* 1907 (Beitrag zur Geschichte der Laryngologie in den Vereinigten Staaten seit Einführung des Laryngoskops), in Section III, (Laryngologische Gesellschaften) "The first Laryngological Society in the United States and, as far as the author can discover, in the world, was the New York Laryngological Society founded October 13th, 1873, with eight members It was reorganized in 1886, as a Section of the New York Academy of Medicine"

it, had been appropriated by this last President and *was never recovered*

This occurrence, as has been amply proved, was a matter of grave importance. It so impressed me at the time that, in my unavailing attempts to recover the records, I became convinced of the great significance which such losses might attain, and of the necessity of so protecting vital documents that their disappearance under ordinary circumstances might be impossible. I, therefore, suggested that, at the time of the construction of the new building of The New York Academy of Medicine, it be equipped with facilities, after the usual manner of the Safe Deposit Companies, by which protection might be provided, safe from burglary, fire or loss, and that the Academy, itself, as well as others properly selected, should have special means for thus safeguarding the more valuable documents. For each depositor a suitable amount of space could be allotted, for which a small rental might be charged. The archives and other treasures belonging to a given Department could be permanently placed in the safe keeping of this room. The Secretary or other officer of a given Society might have access to his own records, but they should always be *left* in the Safe Deposit where other properly accredited persons might surely find them in case of accident. In this way such material might remain in safety, instead of being handed about carelessly and possibly lost. Time has convinced me more forcibly of the value of this, first suggested by Mr James Lenox in the founding of the Presbyterian Hospital and by the experience of the New York Laryngological Society.

The history of the Section of Laryngology of The New York Academy of Medicine was one of unqualified and increasing success. Its Chairmen were efficient, its attendance excellent, and the character of its contributions of a high order of merit, its monthly meetings saw a rallying of the best specialists in the City, as well as others, and there were a large number of younger aspirants who not seldom made themselves known as worthy students of the art and gained much encouragement and instruction. It was never more skillfully managed, more largely attended, nor better

supplied with brilliant contributions to the progress of Medicine than in the last years of its history, offering as it did conditions of general excellence which made it a bright example to the world

About this time it became evident that an Institution of such importance should be quietly influenced by those whose judgment and experience enabled them to cause the Section to make possible the attainment of its best ends. The growth of the Academy of Medicine, together with the passing of the older group of its members, had given rise to possibilities which challenged the attention of those most interested in the Section's welfare. At a dinner given by the late, Dr. Lewis A. Coffin, at the University Club, February 28th, 1927, the matter was discussed and it was suggested that an organization be formed, somewhat after the manner of the original New York Laryngological Society, the membership of which should be limited to those carefully chosen, among men individually eminent in the study and practice of Laryngology, that the meetings should be held as might be agreed upon, and that they should not only further the progress of the specialty by the advancement and discussion of scientific questions, but also that friendly relations between the members might be fostered, most important of all, that the influence of the Society should be exerted for the furtherance of the welfare of the Section of Laryngology of The New York Academy of Medicine and that, through such an influence properly extended, the best interests of the Section might be materially advanced.

In the course of the years that have followed its inception the history of the Society has been gratifying. The scientific exercises have been satisfactory, and it has afforded to each of its members a means of personal appreciation and of friendship.

Meanwhile, however, its main object must never be lost sight of—namely, the responsibility of its influential members, the acknowledged leaders of Laryngology of this time, toward the sustaining of the Academy Section and the active promotion of the best scientific interests and professional influences of that institution.

Mr President, my sterling friend Dr Forbes You have given to me the honor of being the first to initiate this new and superb loving cup, fitting symbol of the integrity, the worth and the dignity of our members, by drinking to the health of the New York Laryngological Society This I do, with full appreciation of your kindness and that of all present towards myself, with fervent wishes for your continued success I pledge you then, the good health of the Society, from the first, now sixty-three years ago, a leader in the advance of Medical Science throughout the world You, my friends, one and all, who have the honor of being its members, should cherish its history, realizing that you are the worthy heritors of a fine tradition, followers of the makers of many of those things which today you and your fortunate patients enjoy May the Society ever be a worthy representative of its great past "SKAAL"

Note —Prepared as above and delivered in part at the Dinner

D B D



ADVICE OF NATHAN SMITH, 1762-1829, ON THE CONDUCT OF AN ACCOUCHEUR

GERTRUDE L. ANNAN

Only a century or so of years have passed since Nathan Smith drove about the streets of New Haven in his chaise making the rounds of his many patients. These years have brought great changes to his native New England, as to the rest of the world. His frequent journeys from Hanover to New Haven, from New Haven to Brunswick or Burlington, were not the casual jaunts of this era of train and airplane, nor were his daily calls in and around New Haven facilitated by wide smooth roads and streamlined motor cars. Even more startling to him perhaps would be the sight of a modern hospital, its operating rooms and laboratories, a vast and many storied structure with labyrinthine halls and corridors. When Nathan Smith died, Pasteur was a lad of seven and Lister a child of two. The futile controversy of claimants for the discovery of anaesthesia was still some years ahead. The practice of medicine and surgery was to face remarkable innovations little dreamed of in the year 1823.

In that year Nathan Smith was serving as Professor of the Theory and Practice of Physic, Surgery and Obstetrics in the Medical Department of Yale University. This would surely seem a tremendous undertaking for one man today, but to Dr. Smith who had formerly taught anatomy and chemistry as well, it meant a lighter burden. In the early days of the medical school at Dartmouth, Dr. Smith was the entire faculty, holding, in the words of Oliver Wendell Holmes, a "Settee of Professorships." His call to Yale had come in 1812 when the decision was made to establish a medical school there. His work in organizing the medical department at Dartmouth had displayed his unquestionable ability, and it is not surprising that he was invited to aid in the new enterprise. His place in the annals of medical education in this country is based on his efforts in these two famous schools, but he found time to assist at the birth of the medical schools of Bowdoin and the University of Vermont as well. During these years his professional

duties were only a small part of his fruitful life. His early and active interest in vaccination, his many brilliant and successful operations, including his ovariotomy, later than McDowell's but entirely independent of it, his conception of the specific nature of disease, were all contributing factors in giving his name prominence in the progress of medicine in America. Dr William H Welch said of him, "He did more for the general advancement of medical and surgical practice than any of his predecessors or contemporaries in this country." Other biographers have agreed that he was fifty years in advance of his time.

One of Dr Smith's students at Yale was a young man named Abraham Lines Smyth, whose early death occurred in 1832. Perhaps his only gift to posterity is a worn and faded notebook in which he inscribed his notes on Dr Smith's lectures in 1823. This manuscript, a recent gift to the Library from Mrs Seth Evans, lacks some of the leaves of notes, but includes a few pages entitled "Directions to the Accoucher by Nathan Smith, M D" with the notation "Not given in his lectures." This description of the conduct and deportment of an obstetrician of the early nineteenth century sheds light on a side of the history of medicine that is usually ignored.

DIRECTIONS TO THE ACCOUCHER [SIC]

NATHAN SMITH, M D

In the observation which I am about to make I do not intend to touch upon the most important part of Midwifery but shall dwell upon those parts which in a medical point of view would be thought unimportant. My object only is in view to render you experience without experience. Practically speaking three things are necessary, 1st, a correct knowledge of what is to be done, 2nd, a determination to do our duty regardless of the opinions of ignorant attendants, 3rd, discharging our duty in such a manner as may be pleasant and agreeable to our patient. The two first qualifications I doubt not you possess. I shall therefore speak principally of your conduct in an Obstetrical room. At this time delicacy in thought, word and deed should form a prominent part of the character of an

Accoucher Delicacy of thought is one thing, and cold reservedness another, the one is servicable and pleasing, the other is displeasing and disgusting. A great deal of familiarity at such a time is proper and often necessary, but is still more to be tinctured with delicacy. It is a fact that there may be the greatest delicacy in conversing on the most indelicate subject. You may sometimes fall into such company that no kind of reserve is necessary, and in which some jesting and some vulgar humor must be indulged. In such cases however never forget your dignity. Be not the foremost, rather smile at the observations of others than make observations for others to laugh at. Be the follower rather than the leader in such a case, till experience has taught you what you may do and say. When called to a woman in labour if you are not immediately invited into the room to your patient, it is best to wait until you are. Then enter the room precisely as you would on any other occasion. Should you feel a modest glow upon your cheek, never mind that trifle. Probably your patient and many of her attendants will have the same blush. Never look about for your patient to address her first, but rather accost those first who are most in your way, or rather conduct yourself as you would at any other time. If there is anyone present of whom you wish to enquire concerning their health or that of their families, or about any of your patients, or the effects of any remedy which you may have prescribed, there is no impropriety in doing it unless you have been called at a late hour and your patient requires immediate attention, when all ceremony must be waived. After you have been sometime in the room you will have observed something of your patient's situation without having been noticed in the character of an Accoucher, and you can easily enter into conversation with her, making any inquiries you think proper. If the woman is young and diffident and her mother or friends of riper years are present it will be proper to direct most of your inquiries to them. Should she be in bed it is my practice to draw my chair to the bedside, or stand by her for a few moments in conversation rather than bawl out my questions across the room. You may perhaps say what ques

tions have I to ask on this occasion, or, in this situation, or stage of business? You may as you approach the bed if you please say How do you do Mrs? and on receiving her answer, you may inquire, at what time Madam was you taken ill? Are your pains regular? Do they leave you free from pain in the intervals? How have you been for sometime past? Have you been feverish? Have you been troubled with a great deal of pain, particularly cramps? What has been the state of your bowels? Have you been in the habit of laxative Med? Are you costive at this time? Do your pains begin in your back? When you have received answers to these questions and others you may think proper to ask you will soon make up your mind whether anything is to be done immediately. If she has been or is now feverish, if her pains do not wholly go off her back in the intervals, if she has had any headache and especially if her pulse be tense, the lancet should be used. If she is costive, an injection, or if there is time for its operation, a dose of oil may be given. If a diarrhoea with griping pains attends give 15 or 20 drops of LL. The pains are seldom very regular when the feet are cold, wherefore if this should be the case, they should be put into warm water and if the cold is extensive, fomentations to the legs and abdomen. If there is a great disposition to faint, a little lavender hearts hoin or tinct of castor may be given, remembering however that fainting and coldness may both proceed from plethora and in that case may be immediately cured by bleeding. If none of the above symptoms require your exertions and attention you may generally suffer things to go on in their own way till the pains become so frequent and strong that it is necessary to insist in delivery. I cannot give you precise instructions when this will become necessary as the strength of the patient cannot be expressed by words, very often you will find the pains not recurring oftener than once in 15 minutes and while this is the case no examination is necessary unless there is reason to expect something wrong. In case flooding comes on or the pains have continued a long time, although they may not be very frequent yet, we may examine and if we

discover such a presentation as requires turning, we may be ready to do it as soon as the *os tincae* is sufficiently dilated and before the waters have escaped. If flooding attends, it may be proper to burst the membranes, discharge the waters and suffer the uterus to contract, which will stop the hemorrhage. It is not proper however on all occasions to break the membranes on account of the hemorrhage when the labour is lingering. Sometimes on examining the *os tincae* you irritate it in such a manner as to produce effectual labour pains. At other times you will discover that the whole delay is owing to a rigidity of the membranes and that as soon as they break, the labour proceeds and is finished immediately. But when nothing requires a deficient [?definite?] conduct, though your patient keeps about, sits, lies or stands, kneels, walks or assumes that posture which is most agreeable to herself, we should generally wait until the pains return once in 5 or 6 minutes. Whenever her pains by their strength point out the necessity of examining, you should suggest to her or to some of her attendants that it is best to prepare a seat for her. Assuring her at the same time that everything is right. She should by no means be kept confined unless you find it necessary, but when her pains have continued for some time it is necessary to know her situation. I shall refer you to Books for the position of your patient, observing only that touching in certain positions is not easily performed, especially by those who are inexperienced. The situations in which touching is difficult are half lying, half sitting, lying flat on the back. In fixing the seat you should be careful to pull the under bed so much on the bedstead that it may not be uneasy to her back. Then raise her, fixed by folded blankets, or let an assistant take hold of her body and ease it into her lap, supporting her head by letting it lie on her breast, one foot of the patient will be placed over a chair on one side of you and the other on the opposite side. Generally an assistant sits in the chair to support the patient's foot on her knee.

The woman will place a shirt round to assist in keeping her comfortable and dry, as this can be changed if necessary but clothes cannot. Your patient being disposed of I

will now attend to your preparations and management. No alteration in your dress is necessary and in ordinary cases none is proper. I know that some physicians will clothe themselves in nightgowns having a shirt before them tied about their waists with a handkerchief or garter with a saucer of grease by their sides, but to me this sight is highly disgusting. Others tie a napkin around their sleeves. This practice if in any case proper should never be followed by me till the labour was so far advanced that I should not afterwards leave my seat and walk about the room. Should you be rigged in this manner and have occasion to walk the room and by chance come before a looking glass, I'll be bound you never will be found in this dress again. The only necessary is to have your coatsleeves made large so that you can slide them up above your elbows. (As all coats according to the present fashion) This can be done in an instant effectually and without being observed by anyone after you are seated and your arm under the patient's clothes. A shirt may be laid loosely in the lap as it can be laid aside whenever you have occasion to leave your seat. As to the saucer of grease, never use it. You can provide yourself with a little pomatum in a box or sweet oil in a vial which you can take from your pocket and return it again or let it lie in your lap. I think the hand should not be withdrawn at every pain as it must be more irritating to withdraw the fingers and return them than to suffer them to remain. If you withdraw your hand between the pains let it remain under the clothes of the patient and by no means hang your arm across the chair in full view. Never make any attempt to throw the lady's clothes over her head when you have got the woman in this position. It is time for you to take your seat. Should you feel any embarrassment from bashfulness it will relieve you a little to continue your conversation on any subject you happen to be conversing about, or you can question her whether her seat can be attended with anything to make it more agreeable and at the same time seating yourself. Do not unless an urgent symptom require, or an urgent pain make it necessary, proceed immediately to an examination, but waste a little time in

adjusting the cloth and placing the patient's feet in the lap of an assistant, supporting her back by placing some one against it, and —When you proceed to examine you may not on all occasions find the *os tincae* but generally succeed if you throw your fingers back upon the center of the perineum and then draw them forward by which means you slip your fingers into the conductor leading directly to the vagina. This however is not very important direction and is designed only to prevent fumbling, passing on you feel the *os tincae* and ascertain the condition of it, as respects the situation of it and its disposition to dilate. You will easily know it by your fingers passing into it, as into the nose of a leather jug. You will find it more or less dilated as the labour is more or less advanced, but in some cases it will not readily be distinguished till you have acquired some experience. Should it be withdrawn back upon the sacrum, you will find the presenting part to be the side of the uterus pushed in a small degree by the head of the child. I have known an instance in which a Midwife mistook this part for the membranes and water pushing forward, and thought every thing was doing well. Some of the attendants expressed uneasiness in consequence of which a surgeon was called in. By great exertions he was enabled to raise the head through the fundus of the uterus forward so that a rupture was prevented, but the uterus had been so stretched in that part that it never recovered its proper situation and the woman remained an invalid. A close attention will enable you to avoid a mistake of this kind as you can always distinguish the uterus from the membrane. If you are at a loss pass your fingers under the *os pubis* and if it is the membrane you feel you can insinuate them between the head of the child and the bones of the pelvis and pass into the uterus itself. Should it be the uterus, you cannot pass up the fingers in this manner. If you feel an artery pulsating between your fingers and the child's head you may be certain your fingers rest against the uterus and not against the membranes. In short you can have no perplexity on this subject except when the womb is fully dilated or supposed to be so.

NEW YORK PHYSICIANS REGISTERED IN THE OFFICE OF THE COUNTY CLERK IN 1806

Among the early minutes of the Medical Society of the County of New York which have recently been placed on deposit in the Library, have been found four sheets of foolscap, sewn together with once red ribbon, folded, and marked on the outside, "Clerks List—No 15 " Inside, the title reads

"A List of Physicians Copies of Deplomas* and
Certificates on file in the Clerks Office of the City
and County of New York the first day of Sept
1806 "

With grateful acknowledgments to the Medical Society of the County of New York we publish this list, believing that it will prove both of interest and of use We have edited it to the extent of completing the somewhat half-hearted attempt at alphabetical order in the original manuscript

H G F

		<i>when filed</i>
Jacob Abramse Jun	Certificate	March 29 1806
Alexander Anderson	Copy of Deploma	Oct 6 1797
Anthony L Anderson	Certificate	Sept 30 1797
Peter Anderson	Copy of Deploma	Oct 2 1797
Charles Andrews	Certificate	Sept 30 1797
Dr Angelis	Copy of Deploma	July 3 1806
George Anthon	Certificate	Sept 30 1797
Jacob S Arden	Do	Feb'y 17 1800
Absalom Bainbridge	Do	Sept 30 1797
Edmund Bainbridge	Do	Oct 2 1797
Isaac Ball	Do	July 15 1806
George W Bancker	Do	May 6 1803
Samuel Barnum	Do	April 5 1799
William Barrow	Copy of Deploma	July 18 1806
William Bartlett Jun	Certificate	Sept 30, 1797
Nicholas Bayard	Do	Jany 19 1798
Joseph Bayley	Copy of Deploma	Aug' 29 1806
Dr Berger	Do	July 25 1806
John Betts Jun	Certificate	Aug' 25 1806
Joseph Bloodgood	Copy of Deploma	July 2 1806

* The clerk, or his secretary, adheres religiously to this spelling throughout the list

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Samuel Bradhurst	Do	Oct 6 1797
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Samuel Nesbitt Jun	Do	June 27 1806
Jacob Ogden	Do	Sept 29 1797
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Shanghai, Weishengshu, 1936, 547 p

DEATHS OF FELLOWS AND HONORARY FELLOW

ACKERMAN, JAMES FRANKLIN, M.D, Asbury Park, New Jersey, graduated in medicine from the New York Homeopathic Medical College in 1890, elected a Fellow of the Academy November 1, 1923, died August 5, 1936. Dr Ackerman was president of the board of governors of the Fithkin Memorial Hospital and chairman of the board of governors of the Marlboro State Hospital. He was a Fellow of the American College of Surgeons and the American Medical Association and a former president of the Monmouth County Medical Society.

BRANNAN, JOHN WINTERS, B A, M.D, 43 West 54 Street, New York City, graduated in medicine from Harvard Medical School in 1878, elected a Fellow of the Academy May 3, 1888, died August 30, 1936. Dr Brannan became a visiting physician to Bellevue Hospital in 1895 and was president

of the board of Bellevue and allied hospitals from 1903 to 1924. At the time of his death he was consulting physician to Bellevue, Ruptured and Crippled, Willard Parker and Polyclinic Hospitals. He was a member of the Association of American Physicians, the American Clinical and Climatological Association and the County and State Medical Societies.

CORWIN, THEODORE WELLINGTON, M.D., 671 Broad Street, Newark, New Jersey, graduated in medicine from the College of Physicians and Surgeons in 1879, elected a Fellow of the Academy October 6, 1898, died September 1, 1936. Dr. Corwin was for many years on the staff of St. Barnabas and St. Michael's Hospitals and was a member of the City Board of Health from 1904 to 1914. He was a Fellow of the American College of Surgeons and a member of the American Laryngological, Rhinological and Otolological Society and the New Jersey State and County Medical Societies.

DOUGHERTY, DANIEL SAMUEL, M.D., 111 West 85 Street, New York City, graduated in medicine from the College of Medicine, New York University in 1884, elected a Fellow of the Academy May 5, 1904, died August 4, 1936. He was otologist to the Polyclinic Hospital and consulting otolaryngologist to the City, Jewish Memorial, Midtown, People's, West Side, Nivick and Long Beach Hospitals. Dr. Dougherty was a Fellow of the American Medical Association and the American College of Surgeons, a member of the American Laryngological, Rhinological and Otolological Society and held a certificate from the American Board of Otolaryngology. For many years and up to the time of his death, Dr. Dougherty was secretary and director of the Medical Society of the County of New York. He was secretary of the Medical Society of the State of New York from 1925 to 1936.

MOYNIHAN, Rt. Hon. LORD BERKELEY, K.C.M.G., C.B., LL.D., M.S., F.R.C.S., Leeds, England, elected an Honorary Fellow of the Academy November 18, 1920, died September 7, 1936.

OASTLER, FRANK RICHARD, A.B., M.D., 45 East 85 Street, New York City, graduated in medicine from the College of Physicians and Surgeons in 1894, elected a Fellow of the Academy October 17, 1912, died August 2, 1936. He was consulting obstetrician and gynecologist to the Lincoln Hospital, consulting gynecologist to St. Luke's, Newburgh, and obstetrician and gynecologist to the Lenox Hill Hospital. He was clinical professor emeritus of gynecology at the College of Physicians and Surgeons and had been on the staff since 1912. Dr. Oastler was a member of the County and State Medical Societies and a Fellow of the American Medical Association and the American College of Surgeons.

RILEY, EDWARD J., M.D., 102 East 68 Street, New York City, graduated in medicine from the Albany Medical College in 1908, elected a Fellow of the Academy February 4, 1932, died August 5, 1936. Dr. Riley was assistant clinical professor of medicine at New York University College of Medicine, visiting physician to St. Vincent's Hospital and St. Elizabeth's Hospital, internist to Foundling Hospital, and consulting physician to St. Joseph's Hospital, Yonkers. He was a Fellow of the American Medical Association and a member of the St. Vincent's Hospital Alumni Association and the County and State Medical Societies.

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CERTAIN OLD AMERICAN MEDICAL WORKS*

ARCHIBALD MALLOCH

There was a medicine native to the Americas when the Spaniards came, the medical ideas, beliefs and superstitions of the Indians, but for the first medical work printed in America we must not look to what is now the United States but to Mexico. Garrison records that Fernandez de Oviedo y Valdes, a viceroy of Mexico, wrote a book published in 1526, a chapter of which describes the medicinal plants of the New World, entitled *Oviedo de la natural ystoria de las Indias*, but this was not published on this continent. It was printed at Toledo. The first genuinely American book, for it was printed in Mexico, is *Opera Medicinalia* by Francisco Barbo and published in 1570. Very few details are known of the author's life. He was a citizen of Osuna in Spain, began to practise in Seville in 1553 and later went to Mexico, the date of his arrival in America probably was 1569 or 1570 for in the latter year we find him praying to be incorporated doctor of medicine in the University there, he had already received that degree from the University of Osuna. The medical school was founded a dozen years later, in 1582, although there had been a hospital from 1524.

The work is written in Latin and is divided into four books. The first is devoted to the disease tabardillo which was epidemic in New Spain at that time. There is a good

* Read before the Beaumont Medical Club of New Haven, 13 December, 1935, and illustrated by lantern slides. It is based upon a *Catalogue of Early and Later Medical Americana*, New York, the Academy of Medicine, 1927. Some of these books have been the subject of several talks, for example, before the Historical Section of this Academy, 31 October, 1927.

deal of question as to the nature of this particular sickness, some think it was a peculiar form of scarlet fever, others that we must look upon it as yellow fever, and still others as typhus fever. The second book deals with venesection in pleurisy and is said to be an exact reproduction of Nicolás Monardes' book which was published at Seville in 1539. It was a much debated question with the Greeks, with the Arabs, and even with Vesalius who wrote about it, whether patients should always be let blood from the arm of the same side regardless of whether the pleurisy was on that or on the opposite side. The doctrine of "critical days" in disease as given by Hippocrates and Galen is dealt with in the third book. We take little stock nowadays of the idea of "critical days" and if we were of a mind to bleed or to give a certain draught we should not stop to think what day of the month it was nor take thought of the position of the moon or stars. The fourth or last book is about sarsaparilla root and its medical properties, this plant being illustrated in the book.

Perhaps we should be interested in the medical and historical aspects only of this work but when I tell you that it is extremely rare and that the whereabouts of only three copies can now be traced your bibliographical instincts, actual or potential, may possibly be aroused. As you see on the screen the date 1570 does not appear at the foot of the title page, and the date 1549 on the ornamental wood cut portico which surrounds the title caused much confusion to bibliographers. In 1862 this particular copy of the work was bought at Sotheby's sale of Count Labri's (1803-1869) books, for the Lenox Library, which is now part of the New York Public Library. At first it was thought that 1519 was a mistake of the printer as mention is made in the book of a man who did not hold office in Mexico until after that date. The copy of the work which belonged to Dr. Nicolás León of Mexico has the date 1570, printed at the foot of the title-page. If the New York copy is closely examined, it will be seen that this date has been cut away and the foot of the page deftly mended. I for got to say that the last page of the book, bearing the colo

phon with date and place of printing, is also missing from the New York copy. To those who know the story of the "faking" of books the facts can be explained. Count Libri was a famous mathematician and a learned book-lover but he was detected in more than one instance of cheating and stealing books and manuscripts. Book robbers may turn up even in the most polite circles. The greatest thief of the property of a very well-known library was a member of the board—and the librarian knew it all the time. If we are right in our suspicions, then by removing all traces of the real date, 1570, Libri sought to make others think the book was printed in 1549. Time has revealed the León copy with the real date and it has been shown that the ornamental portico was previously used for the *Dialogos* of Cervantes Salazar printed in 1549. And, not least important of all, HARRISSE, the great bibliographer, found in Spain the missing clipping from the page which bore the date 1570 and in 1872 had it in his possession.

The finding of this Mexican work suggested looking further south, and when we were arranging a display of "Early and Later Medical Americana" at the New York Academy of Medicine, we looked up to see what was the title of the first medical book published in South America. The University of Lima was founded in 1553 and the medical school in 1638. Before the latter date, however, the book by Francisco Figueroa entitled *Dos tratados, uno de las calidades y efectos de la aloja, y otro de una especie de garrotillo ó esquinancia mortal*, Lima, 1616, had appeared. Nothing is known of the author and we can only imagine the contents of the book except for what we can learn from the title, as no copy can be discovered. Dr. José Toribio Medina, the great bibliographer, has never set eyes on the book but has seen it referred to by title. The title being interpreted, means two treatises, one of the nature and effects of aloja which is a drink made of honey, spices, and water, none other than the old English mead or metheglin. The other treatise is upon garrotillo (which is Spanish for quinsy) or fatal inflammation of the throat. In those days diphtheria, tonsillitis, quinsy, the sore throat of scarlet

fever and other affections were not distinguished and it is an interesting fact that some of the earliest medical writings of North America are on sore throat also. After all it was quite natural, for that affection, like the poor, we all ways have with us.

We now come to the first medical book published in what is now the United States and you shall see that it appeared more than one hundred years after the Mexican one. It is not a book in the ordinary sense of the term for it is a folio broadside in two columns printed on one side of the sheet only. This is a photograph of the unique example which is preserved in the Massachusetts Historical Society, entitled *A Brief Rule to Guide the Common-People of New England how to order themselves and thens in the Small Pocks, or Measels* by Thomas Thacher (1620-1678) and was published at Boston in 1677. The author was born in England in 1620 and, refusing to enter a university there, emigrated to America as a youth, soon after being apprenticed to Dr Charles Chauncey (1589-1671), an M D of Cambridge, England, pastor of the church in Scituate, and later the second president of Harvard College. Thacher was a good scholar and was ordained a minister in 1641 and became pastor of the Old South Church. Like his preceptor and other Puritans in New England, Thacher was both doctor and minister. He had this broadside printed at a very opportune moment as between 1676 and 1678 smallpox prevailed at Boston. It is said that he was thought at the time to be one of the best doctors there but at the date of the broadside he tells the "Candid Reader," as he puts it, that it has been written not for the "Learned Physitian" but for the public and adds "I am, though no Physitian, yet a well wisher to the sick." I do not know whether he was the first to point it out or not, but Dr H E Handerson (1837-1918), of Cleveland, showed in 1899 (*Janus*, 1899, iv, 543) that Thacher's publication is merely a full translation of Sydenham's medical observations upon smallpox. The current views on the why and wherefore of the rash, directions for changes in diet and

medication with alterations in the type or prominence of the pustules, etc., are given. Thacher died in 1678 of a fever contracted from one of his patients. It is true that no medical work was printed in the Colonies before this one, but we are told of the plants and animals, and we get an amusing and, at the same time an instructive, picture of the ordinary remedies in use in *New-Englands Rarities Together with the Physical and Chyrurgical Remedies wherewith the Natives constantly use to Cure their Distempers, Wounds, and Sores*. By John Josselyn, Gent, London, 1672. Josselyn (fl 1675) came twice to America from England to visit his brother in Maine, once for a year in 1638 and again in 1663 when he remained for eight years and a half. I had hoped to find that an early American edition had appeared before 1677, but alas there was none until that from Boston in 1865. "Pompions" is the old word Josselyn uses for pumpkins and he gives directions for the preparation of what he calls "The ancient New-England standing Dish" —how they should be cut into dice and stewed all day, adding "Vinegar (with some spice as ginger, etc.) which makes it tart like an Apple, and so serve it up to be eaten with Fish or Flesh."

The first purely medical Canadian publication I have been able to trace is entitled *Direction pour la Guérison du Mal de la Baie St Paul* which was published "chez Guillaume Brown," Quebec, in 1785. At first the copy in the Library of the Archives of the Province of Quebec seemed to be a unique one, but I saw another one a few years ago at the Sulpician Library, Montreal at the time of a meeting of the Medical Library Association. No author's name is printed in the book but the Quebec copy is endorsed in writing, "par le Dr Badelaid." La Baie St Paul is on the north shore of the St Lawrence below Quebec about twenty miles or so above "Mal Baie" or what is now called Murray Bay. M Badilaid (or Badelaid), according to Mr Justice William Renwick Riddell (*Urologic and Cutaneous Review*, 1923, xxvii, 145-150) was a surgeon major in the French service and in 1777 was appointed hospital, or surgeon's, mate to the garrison of Quebec and several times

visited Baie St Paul The disease began about 1770 and spread over a considerable portion of the country It was said to have originated with a detachment of Scottish soldiers and the Canadians called it "le mal anglais", indeed it passed under many different names Swediaur (see the translation of his work into English, *A Complete Treatise on the Symptoms, Effects, Nature and Treatment of Syphilis*, Phila, 1815, chap xxv) has an account of it The disease was cured by mercury and apparently was syphilis flourishing on fresh soil and the descriptions of the generalized lesions read, as Riddell says, like those of Fracastorius

Even though it is of no great importance, it is interesting to know that the first medical magazine published in this country was a translation of a French one (*Journal de Médecine Militaire publié par ordre du roi*, Paris, a quarterly, seven volumes, 1782-1788) which appeared with the title, *A Journal of the Practice of Medicine, Surgery, and Pharmacy, in the Military Hospitals of France Translated from the French by Joseph Browne*, New York, Printed by J McLean and Co The only copy, I have heard of, is at the Army Medical Library and they have only the first number of the first volume there It is thought to have been printed in 1783 or 1790 Happy is the library that possesses a file of *The Medical Repository*, the first American medical periodical The first edition, printed by T & J Swords of New York, made up of twenty three volumes, was published between 1799 and 1824 The "Circular Address" in the first volume is signed by Samuel L Mitchill, a splendid medical author who wrote also on other branches of knowledge, Edward Miller, and E H Smith I shall not attempt to tell you of the other editions of this journal Correspondence and book reviews in the magazine are important as well as the original articles The journal is much prized today by collectors of Americana for its early accounts of explorations in the West and other such items I show a slide of the first Canadian medical periodical, *Journal de Médecine de Québec*, a quarterly of two volumes which began in 1826 and ended

in 1827 and had articles in English as well as French. The oldest Canadian hospital, the Hôtel Dieu at Quebec, founded in 1639, provides the hospital reports

The next group of medical writings which I wish to take up are concerned with the inoculation treatment of smallpox and are familiarly known as the "inoculation pamphlets." The New York Academy of Medicine is fortunate in possessing almost a score of these. They are not all scientifically valuable but they serve to show how this therapeutic measure was introduced into this country, the opposition aroused, and how gradually the opinion of the doctors and the laity came to support it. As examples of early American printing these pamphlets are very valuable indeed.

In 1721 the sixth epidemic of smallpox broke out at Boston, the fifth having occurred in 1702 so that parents were fearful lest their children born after that date should contract the disease. It is true as Garrison says that "the mere idea of inoculation is apparently as old as the hills" but it was made known in England by communications to the Royal Society in the years 1713 to 1716, concerning the experiences in Turkey of two Greek physicians, Timoni and Pylarini. Lady Mary Wortley Montagu (1689-1762) must not be forgotten. She was the wife of the British Ambassador at Constantinople, wrote to her English friends about the practice, and had her little son inoculated in 1718. This inspired people in England and the custom was introduced there.

It is interesting that the wide awake Rev. Cotton Mather (1663-1728) of Boston read the accounts by the Greek physicians in the *Philosophical Transactions* and was the first in Boston to see their significance. He tried to arouse the physicians but with little success for storms of abuse from the profession and laity burst upon him and our collection of pamphlets shows this well. Zabdiel Boylston (1679-1766) who was born in Brookline, Mass., and studied under Dr. John Cutler of Boston is deserving of all praise for he was the first to inoculate in North America, as far

as we know On 26 June, 1721, he inoculated his six year old son and also his negro slaves, Jack, thirty six years of age, and Jackey, aged two and a half Boylston's pamphlet is called, *An Historical Account of the Small-Pox inoculated in New England, upon all Sorts of Persons, Whites, Blacks* The Second Edition, corrected London Printed

MDCCXXVI Re-Printed at Boston in N E for S Gerrish in Cornhil, and T Hancock at the Bible and Three Crowns in Annstreet, MDCCXXX Increase Mather (1639-1723) also a minister, supported his son Cotton, as did the Rev Benjamin Colman (1673-1747) and the Rev William Cooper (1694-1743) We have some anonymous pamphlets, one of which bears the title *A Vindication of the Ministers of Boston, from the Abuses & Scandals, lately cast upon them, in Diverse Printed Papers* ,

Boston, 1722 Not only were some of these tracts published anonymously but pseudonyms appeared in the titles Isaac Greenwood (1702-1745) the mathematician, is thought to have written one entitled *A Friendly Debate; or, a Dialogue, between Academicus, and Sawny & Mundungus, two Eminent Physicians, about some of their Late Performances* , Boston, 1722 "Mundungus" may have stood for Dr J Williams (1661-1729) and it is supposed that "Sawny" represents Dr William Douglass (1692-1752), the best known doctor in America at that time He was a Scot who settled in Boston in 1718 Douglass it was, who, by irony of circumstances had lent the *Philosophical Transactions*, which contained the account of inoculation, to Cotton Mather, but in order that Mather should read another article On this occasion the church had more foresight and was more keen witted than the medical profession as Douglass was much opposed to the new measure and wrote and published a tract addressed to Alexander Stuart (1673-1742), who was physician to Queen Caroline That was in 1722, but it is most pleasing to learn that in 1730 Douglass saw the error of his ways and was man enough to publish a pamphlet saying so Many were the hard words used, and one preacher, Edmund Massey, uttered his opinion in his *Sermon against the Dangerous*

and sinful Practice of Inoculation , Boston, 1730, that none other than Satan himself was the first inoculator A *Letter to a Friend in the Country, Attempting a Solution of the Scruples & Objections of a Conscientious or Religious Nature, commonly made against the New Way of Receiving the Small-Pox* , Boston, 1721, was also written by a minister, William Cooper (1694-1743) There were as many objections raised on religious grounds as when Sir James Y Simpson sought to introduce anaesthesia into the practice of midwifery

That wonderful "many sided" man Benjamin Franklin (1706-1790) and William Heberden (1710-1801), the London physician, each wrote one part of what is now known as the Franklin-Heberden pamphlet, London, 1759 The Academy luckily has a copy The great John Morgan (1735-1789) and Benjamin Rush (1745-1813) of Philadelphia were enthusiastic inoculators also

The most important name after that of Boylston in the history of the fight against smallpox in North America is Benjamin Waterhouse (1754-1846), Boylston was the first to inoculate and Waterhouse in 1800 was the first to vaccinate in the United States You will remember that Edward Jenner (1749-1823) vaccinated for the first time in 1796 and his work *An Inquiry into the Causes and Effects of Variolae Vaccinae* was published in 1798 Waterhouse was the first Professor of the theory and practice of medicine at Harvard In July 1800 he vaccinated his four children His work is entitled *A Prospect of Extirminating the Small-Pox* , Boston, 1800, and "Part II" appeared in 1802 Thomas Jefferson did much to introduce vaccination into this country *

* Since this paper was read, Dr Robert H Halsey has published, *How the President, Thomas Jefferson and Doctor Benjamin Waterhouse Established Vaccination as a Public Health Procedure*, N Y, 1936, 58 p, 3 pl, which is no 5 in the "History of Medicine Series Issued under the Auspices of the Library of the New York Academy of Medicine"

John Tennent was an interesting figure in American medicine. Unfortunately we do not know his dates, but he was born in England and came out to Virginia about 1725. His chief claim to fame has been that he introduced senega or rattlesnake root to the profession as a remedy and we have the second edition of his *An Essay on the Pleurisy*, Williamsburg, Printed New York Reprinted and Sold by James Parker 1742, the first edition having been printed in 1736 at Williamsburg, Va., by William Parks. If you listen to Tennent's own words you will see how logical he was in adopting this remedy from the Indians. He says

Again, as I observed before, since we are to infer the Sameness of Causes from the Likeness of Effects, there is another Reason why it should be done in this case, and that is, that those who have the Misfortune to be bit by a Rattle-Snake do spit up Blood, and cough like *Pleuritic* Patients, therefore it is beyond all Controversy that the Blood of a *Pleuritic* Patient, and that of one bit by a Rattle-Snake, is in the same State, or very near it. Upon this Certainty of Reasoning, I gave the Rattle-Snake Root to several Patients in a *Pleurisy* or *Peripneumony*, and it's Effects were extraordinary. I found it to exceed the *volatile Salt of Vipers*, or any thing that I ever knew given in that Disease. In short, it may justly be deemed a Certain Remedy.

A perusal of Tennent's *Essay* is sufficient to show that by "pleurisy" he really meant "pneumonia."

The first book printed in America on domestic medicine which I can find is anonymous and has the title *Every Man his own Doctor* or, *The Poor Planter's Physician*, the second edition. Printed and sold by William Parks, at his Printing Offices in Williamsburg, and Annapolis, 1734. Price, One Shilling. A John Archer (fl. 1660-1684) wrote a book in England with the title *Every Man His Own Doctor*, London, 1671, of which we have the second edition, London, 1673, but this does not resemble *The Poor*

Planter's Physician It has been suggested that Tennent was the author of the American book, and I think this is probably true, as Snake root is mentioned as a remedy

The next book is shown for several reasons, but one of the most important is that it was printed by Benjamin Franklin, and you need only look at the taste displayed in the title page to see that he was a great printer The book is *Essay on the West-India Dry-Gripes, with the Method of Preventing and Curing that Cruel Distemper To which is added, an Extraordinary Case in Physick* Philadelphia Printed and sold by B Franklin, 1745 The author was Thomas Cadwalader (1708-1799) who was born in Philadelphia and studied medicine in New York and in Europe On the foundation of the Pennsylvania Hospital, which by the way is the oldest of the hospitals now existing in the United States, Cadwalader was made physician The "Dry Gripes" are nothing more or less than lead colic, which was known in Southern France as early as the sixteenth century by the name of *colica Pictonum* and later in England as "Devonshire colic" Cadwalader did not know that lead was the cause of the colic but writes that drinking strong drams and strong punch and that the eating of "salted and high seasoned meats" played a part in bringing it about It is generally said that Sir George Baker (1722-1809) in 1767 found that the cider time colic was due to lead in the vats, but it is interesting to note that in 1786 Franklin wrote a letter to Mr Vaughan (Benjamin Vaughan, 1751-1835) (see John Hunter's [d 1809] *Observations on the Disease of the Army in Jamaica*, London, 1788, p 266-273) saying,

The first thing I remember of this kind, was a general discourse in Boston when I was a boy, of a complaint from North Carolina against New England rum, that it poisoned their people, giving them the dry belly-ach, with a loss of the use of their limbs The distilleries being examined on the occasion, it was found that several of them used leaden still-heads and worms, and the physicians were of opinion that the mischief was occasioned by that use of lead The

legislature of the Massachusetts thereupon passed an act, prohibiting, under severe penalties, the use of such still-heads and worms thereafter

The law* referred to was passed July 31, 1723 and was entitled "An Act for preventing abuses in distilling of Rhum and other strong Liquors with leaded heads or pipes," and begins

Whereas the Strong Liquors and Spirits that are Distilled thro' leaden Heads or Pipes, are judged on good grounds to be Unwholesome and Hurtful, For Prevention whereof Be it enacted That no Person whatsoever, shall make use of any such Leaden Heads or Worms for the future, and that whosoever shall presume to Distil, or draw off any Spirits or Strong Liquors thro' such Leaden Heads or Worms, shall forfeit and pay a Fine of *One Hundred Pounds*

This law included also makers of pewter, and ordered that two men should be chosen annually in each town in the province to "inspect and make Tryal of any such Heads and Worms" In 1767 in an address to the College of Physicians of London, (*Medical Transactions*, London, 1785, p 286), Sir George Baker states that his

suspensions, concerning this subject, have been greatly confirmed by the authority of Dr Franklyn of Philadelphia That gentleman informs me, that, at Boston, about forty years ago, leaden worms were used for the distillation of rum In consequence thereof, such violent disorders were complained of by the drinkers of new rum, that the government found it expedient to enact a law, forbidding the use of any worms, except such only as were made of pure block-tin

The name of Bard is doubly important in the annals of medicine in America, for there were two men, father and son John Bard (1716-1799), the father, was born at Bu

* See also an editorial by me in *Annals of Medical History*, 1931, ns III, 455-458, which should have borne the title "An Early Law to Prevent Lead Poisoning"

lington, New Jersey, and was apprenticed to the English surgeon John Keaisley (1685-1772) of Philadelphia. He was a friend of Franklin and came to practice in New York on the latter's advice. He and Dr. Peter Middleton (*d* 1781) made the first anatomical dissection recorded in this country, but his greatest claim to fame is that in 1759 he performed the first operation for extra-uterine foetus (*Med. Observations and Inquiries by a Society of Physicians in London*, London, 1762, II, 369-372), the woman recovered. In the early days when there were no scientific magazines here, it was quite common for doctors to send their communications to learned societies in England or Scotland as Bard did on this occasion. I show a slide of the first page of Bard's "Essay on Malignant Pleurisy," which occupies both sides of a dozen leaves of paper. It is, I think, the oldest American MS. we possess at The New York Academy of Medicine. It is an account of pneumonia on Long Island in 1749. It is endorsed thus: "Drawn up at the request of a Weekly Society of Gentlemen in New York, and Addressed to them at one of their Meetings." It is evident, then, there was a medical society in New York in those days, but one had already been founded in Boston in 1735, fourteen years before. The honour of being the first to publish cases in its own volume probably goes to the Medical Society of New Haven County founded in 1784. It was issued in 1788. Unfortunately a professional scribe wrote Bard's essay, but I take it that the corrections are in John Bard's hand. Bard was much influenced by Sydenham's epidemiology and to be sure in parts of the "Essay" the ideas seem to have lost themselves in words. Who can foretell, however, that two hundred years hence the same will not be said of present day writings?

We now come to one of the most important literary and valuable manuscript treasures in The New York Academy of Medicine. It is a letter written by Benjamin Franklin (1706-1790) from Philadelphia on 8 December, 1752, to his brother John of Boston. It has been published in John Bigelow's edition of Franklin's works (1888, X, 264-266).

and in Albert Henry Smyth's edition (1907, III, 103-105) and was presented to the Academy by Fessenden Nott Otis (1825-1900), the urologist*. This letter must have been of great interest to Otis, for it is about a flexible catheter which Benjamin had made for his brother. Otis knew that Franklin did not invent the flexible catheter, for one Roncallus improved his own in 1720. The letter opens with the sentence

Reflecting yesterday on your Desire to have a flexible Catheter, A thought struck into my Mind how one might possibly be made. And lest you should not readily conceive it by any description of mine, I went immediately to the Silversmith's & gave Directions for making one, (sitting by till it was finish'd), that it might be ready for this Post.

Benjamin by his remarks and suggestions as to improvements if it did not work well, shows that he thoroughly understood what was required of such an instrument. John almost certainly suffered from stone and he had evidently asked Benjamin's opinion about what should be done and upon Robert Whytt's (1714-1766) treatment of stone with lime water (*Medical Essays and Observations Revised and Published by a Society in Edinburgh*, 1744, V, Part II, Art. LXIX, 667-750 and *An Essay on the Virtue of Lime Water and Soap in the Cure of Stone*, Edin. 1752, 12°). Benjamin at the end of his letter writes that he had read "Whytt on Lime Water." He thinks the experiments are good and adds as postscript that they "are approv'd & recommended by Dr. Mead" but is too canny to give his opinion upon the possibilities of such treatment. He shrewdly answers what was evidently another question with the remark "May not one guess by holding Lime Water sometime [*sic*] in one's Mouth, whether it is likely to injure the Bladder?"

* This letter has been reproduced in facsimile and published by the Morrill Press, Fulton, N. Y., 1934, together with a comment by Dr. Edward Foughbrough Keves.

The leaf which bears the address, and was folded to enclose the letter, bears a crest in red sealing wax and on my inquiries to prove this was Franklin's I was told by Mr George Simpson Eddy, a great authority on him, that there had been a mild family row about it. Now John was a soap maker as well as a printer and he wished to impress the coat of arms upon the fair face of his soap, but Benjamin would have none of it and later advised his sister, Miss Jane Mecom, not to allow her young son to do so either (*The Writings of Benjamin Franklin*, edited by Albert Henry Smyth, 1907, III, 403)

John Morgan (1735-1789) should not be omitted from any sketch of early American medicine. He was born in Philadelphia where he studied under John Redman (1722-1808) as his apprentice for six years, then, after being surgeon in the Army for four years, he went to Edinburgh where he got his degree in 1762, and later studied in France and Italy. On returning to Philadelphia after five years abroad he founded in 1765 the first medical school in the American Colonies—the medical department of the University of Pennsylvania then known as the College of Philadelphia. He became the first professor of the theory and practice of physic. In 1775 he was made Director General and Physician in Chief of the American Army, succeeding Benjamin Church (1734-1776), who had been imprisoned as a traitor, but rivalries and political quarrels were sufficient to induce Congress to dismiss him wrongly in 1777. His position was taken by William Shippen, Jun (1736-1808). In 1779 a court of inquiry vindicated Morgan. I wish to show one of his books because it is the first American publication on medical education, it is entitled *A Discourse upon the Institution of Medical Schools in America*, Philadelphia, 1765. This is addressed "To the Trustees of the College, and the Citizens of Philadelphia." A most interesting preface gives side lights upon the times especially upon the question of fees and whether the fee for medicines should be included with that for attendance. Morgan says that he will practise medicine

only and will not prepare prescriptions or do surgical operations. In the *Discourse* itself the nature and importance of each of the branches of medical undergraduate study is discussed. Now there is everywhere in the air around us a discussion about medical education and it is wholesome to learn from reading this book that there was great concern even in 1765 about what, and how, and when a student should be taught. The section "Pre requisites to the Study of Medicine," is important and Morgan puts the matter in a nutshell.

Young men ought to come well prepared for the study of Medicine, by having their minds enriched with all the aids they can receive from the languages and the liberal arts. There is no art yet known which may not contribute somewhat to the improvement of Medicine, nor is there any one which requires more assistance than that of Physic from every other science. Let young men therefore, who would engage in the pursuit of Medicine or Surgery, make use of all their industry, to possess themselves in good time of these acquisitions. They are necessary to facilitate progress in the healing arts, they embellish the understanding, and give many peculiar advantages, unattainable without them.

The first American publication on medical history entitled *A Medical Discourse, or an Historical Inquiry into the Ancient State of Medicine*, was written by Peter Middleton (d 1781) and printed in New York by that important printer, Hugh Gaîne, in 1769. Middleton was a Scotsman who studied at St. Andrew's and emigrated to New York. As noted above, he and John Bard in 1750 carried out the first anatomical dissection in the United States, or at least the first of which we have record. He was influential in helping to found the medical department of King's College, later Columbia University, where he was professor of pathology and physiology. The address is one which sweeps widely over the history of medicine from its first beginnings and in all countries "from China to Peru."

Quite appropriately a couple of pages are devoted to the religious and medical ideas and practices of "the warlike savages of North-America "

We now come to the works of Samuel Bard (1742-1821) one of the most important medical men of eighteenth century New York. He was the son of John Bard, and helped to found the medical department of King's College (Columbia) in 1767 where he was the first professor of the theory and practice of medicine, and the New York Hospital in 1771, although it was not opened until 1791. The first of his books which I wish to show you is also the first American publication on medical ethics—*A Discourse upon the Duties of a Physician* , New York, A. & J. Robertson, 1769. He lays stress upon the necessity for high ideals amongst physicians and right conduct towards the poor and towards their brother practitioners. Also he pleads that a hospital should be founded in New York. This address of eighteen pages has a peculiar interest for The New York Academy of Medicine for the quotation from Cicero, *Homines ad Deos, nulla re propius accedunt, quam Salutem Hominibus dando*, which Dr. Dana has translated "Men in no way approach so nearly to the gods as in giving health to men," stands at the head of the first page, and now it is carved on the north face of the new building of the Academy. This motto was first used in our *Transactions* in the first volume of the second series in 1874. I thought it probable that the quotation for the Academy was first hit upon in this *Discourse* but lately, in rummaging amongst some old books, I have seen that it was used by Gooch on the title-page of his *Practical Treatise on Wounds* , Norwich, 1767, and perhaps the bright eye of some father of the Academy spied it out there. And again I cannot say whether or not one of them knew his Cicero at first hand! We have the *Discourse* in facsimile only, but there are copies at Columbia and the New York Public Library. Our copy of the original edition was given away—before I came to the Academy.

Samuel Bard's important contribution was *An Enquiry into the Nature Cause, and Cure of Angina Suffocativa*

New York, 1771 This disease was diphtheria and surely his was a finely descriptive name for it, in those days long before O'Dwyer's (1841-1898) intubation and before the antitoxin treatment were introduced This was not the first American book on sore throat, the most important previous one being William Douglass's (1692-1752) *The Practical History of a New Epidemical Eruptive Miliary Fever, with an Angina Ulcuculosa* , Boston, 1736 It is very difficult indeed to make out what affection of the throat is described in these old writings, for it is not an easy task for us to throw ourselves back and gain their point of view Douglass's book is generally thought to be about scarlet fever In Richard Bayley's (1745-1801) book, *Cases of Angina Trachealis, with the Mode of Cure* , New York, Hugh Gaime, 1781, there is an interesting list of synonyms for diphtheria I wonder how many of us know that the disease was sometimes called "the hives," "the bladder in the throat," etc This book is rare indeed (and we should be proud that we have a copy) for in *The Medical Repository*, the first American medical magazine, for 1808-1809, Second Hexade, VI, 331-339, it is stated that a complete copy could not be found, but it was reprinted incomplete as it was The gap was filled in the same journal for 1810-1811, Third Hexade, II, 345-351 Bayley was professor of surgery at Columbia College and health officer in New York

Samuel Bard was also author of the first American text book of obstetrics, *A Compendium of the Theory and Practice of Midwifery* , New York, 1807 This passed through five editions and Bard's own copy of the last one (1819) is in the Academy and is divided up into many sections, interleaved with blank sheets and contains many manuscript changes in text and figures for a further edition

The first American textbook of surgery and military surgery was written by John Jones (1729-1791) He was born on Long Island and was a pupil of Thomas Cadwalader of Philadelphia and of the great William Hunter

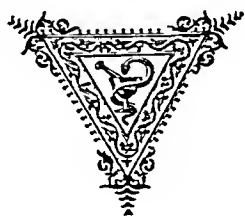
(1718-1783) of London Jones practised surgery in New York, was professor of that subject in King's College, and was the first lithotomist there His book *Plain Concise Practical Remarks on the Treatment of Wounds and Fractures*, New York, 1775, is dedicated to Jones's teacher, Cadwalader, and is dated 12 October, 1775 It is just the sort of book one should expect from a good surgeon—brief and to the point with only ninety-two pages Do you remember that it was said of the great Syme (1799-1870) that "he never wasted a word, nor a drop of ink, nor a drop of blood"? Syme's important *Principles of Surgery*, fifth edition and last, 1863, was smaller than the first edition of 1832 In Jones's book there are chapters on wounds in general, inflammation, penetrating wounds of the thorax and abdomen, fractures, blows on the head and concussion, injuries arising from fractures of the skull, gunshot wounds, and finally an appendix giving hints upon the structure and economy of hospitals The most interesting chapters, to my mind, are about head injuries On account of the war, the second edition, 1776, was issued from Philadelphia

Richard Cort Skinner was the author of the first American book on dentistry The title is indeed a mouthful—*A Treatise on the Human Teeth, concisely explaining their Structure, and Cause of Disease and Decay to which is added, the most Beneficial and Effectual Method of Treating all Disorders Incidental to the Teeth and Gums, with Directions for their Judicious Extraction, and Proper Mode of Preservation Interspersed with Observations interesting to, and Worthy the Attention of Every Individual* By R C Skinner, Surgeon Dentist New York Printed by Johnson & Stuyker, No 29 Gold Street, for the Author, 1801 Copyright secured As the author says in his preface, this unbound tract of twenty six pages "is put into the hands of the public, for the inconsiderable sum of thirty cents" Up to a short time ago nothing more was known of Skinner than that he was author of this pamphlet But thanks to the tireless exertions of Dr Bernhard W Weinberger, the historian of dentistry and Consultant

in Dental Bibliography to The New York Academy of Medicine, who has kindly given me information, some details of his life stand revealed. He was an Englishman who had studied dentistry under Bartolomeo Ruspini of Pall Mall, one of the most successful practitioners of London. The first record of him in this country is found in a letter he wrote in 1788 at Philadelphia to Benjamin Franklin in which he relates that he is in poverty and wishes the loan of twenty dollars with which to set up in practice there. Dr. Weinberger by discovering advertisements in various newspapers has learnt that Skinner began to practise at Philadelphia early in 1789, moved to New York in 1791 and at first lived at 27 John Street. He was appointed dentist to the Dispensary of New York City. He advertised in the *Hudson Gazette* in 1795 and in the *Norfolk Herald* in 1796, for he was itinerant dentist and spent some time here and some time there. He bobs up again at Philadelphia in 1796 and the first of many visits to Hartford was in 1800. He married Miss Mary Whiteman of Hartford. Apparently his *Treatise on the Human Teeth* had been published as early as 1796, but a copy cannot be found. The copy of the 1801 edition at the Academy bears an inscription, probably in the author's hand, below the imprint commencing with the words, "R. C. Skinner Respectfully [informs] the public" etc. so it is likely that his work was mildly advertised. We must remember, however, that what is considered advertising today was not necessarily counted as such a century or so ago. Indeed his "Advertisement to the Public" states that he is "uninfluenced by expectations of remuneration." At the end of the tract is a list of "Established Fees" and it is interesting to note that this dentist charged three guineas "for setting a common cork leg." He also put in artificial eyes and "transplanted artificial and living teeth." This rare little pamphlet was indeed the beginning of great things in dentistry on this continent.

We owe a great debt of gratitude to James Thacher who was born in 1754 at Barnstable, Massachusetts, and died in 1844 at Plymouth, for he was author of the first book

on American medical biography It is called *American Medical Biography*, Boston, 1828, and as is stated on the title page the book is usually found bound "two volumes in one" The two volumes together fill seven hundred and sixteen pages, and are a veritable mine of information At the beginning of the first volume there is a valuable history of medicine in America, state by state, which takes up eighty five pages During the Revolution, Thacher served first as surgeon's mate and then as surgeon, and his military journal, I am told, is an important source book Thacher wrote *The American New Dispensatory*, 1810, *The American Orchardist*, 1822, and other books The large photograph of his portrait which I have at home belonged to Sir William Osler, and beneath it is written "Author of the first American Textbook," that is, *American Modern Practice*, Boston, 1817



FRANS CORNELIS DONDERS
DUTCH PHYSIOLOGIST AND OPHTHALMOLOGIST

RAYMOND L. PFEIFFER

The eminence of Holland in medical history began with the clinical method of instruction advocated first by Jan Van Heurne in 1591. A few years later the brilliant expositor, Franciscus Sylvius, who was one of the first to accept the theory of the circulation of the blood advanced by his contemporary Harvey, and apply it to teaching, placed Holland foremost in medical education.

In the 17th century the universities of Leyden, Amsterdam, and The Hague, were great centers of teaching. At Leyden were Sylvius, Ruysch, Nuck, and Bidloo, foremost anatomists of the period, who were portrayed on canvas by the great artists Rembrandt, Adriaen Backer, and van Neck. Here at Leyden was built, at the instigation of Sylvius, the first university laboratory in which his pupils, Willis, de Graaf, Stenson, and Swammerdam, probably studied. At Amsterdam were Roonhuyze, a skillful operator, gynecologist, and orthopedist, and Swammerdam, a microscopist, who made many discoveries in comparative and human anatomy. At The Hague was van Deventer, "the father of modern midwifery." At this time, too, van Leeuwenhoek of Delft, that shrewd and brilliant observer, was announcing his startling discoveries to the Royal Society at London.

In the 18th century Herman Boerhaave, the greatest physician of modern times, alone made Holland the center of medical culture. With his great clinical and diagnostic acumen, Boerhaave, a man of wide learning, an incomparable lecturer, skilled chemist, botanist and anatomist, attracted students from far and wide. The inspiration of Boerhaave led to the founding of the Edinburgh Medical School, and through it to the beginning of modern medical teaching in the English-speaking countries of the world. He is regarded by Charles Singer as the one person to whom English medicine is most indebted. His pupil, Haller, is

the only figure at all comparable to him in the 18th century. Van Swieten, also a pupil of Boerhaave, and a Dutchman, was called to Vienna, and raised the medical school there to international prominence. It is to van Swieten that the University of Vienna owes its world wide reputation, and Austria no small share of her importance as a cultural center.

In the 19th century Frans Cornelis Donders, upon whose place in medical history we wish to focus attention, stands out as the greatest Hollander of medical science: great first as physiologist, then as ophthalmologist. It is as ophthalmologist that his name will go down in history among the immortals. His great work, the elucidation of the anomalies of refraction and accommodation, a contribution to physiologic optics, stands today as a classic and the authority on refraction. This work, with that of Helmholtz and von Graefe, placed ophthalmology and the surgery of the eye on a scientific basis. As a man there is perhaps in the whole history of medicine no character more noble, no personality more attractive, no "savant" more deserving of the adjectives "great" and "good" than Donders.

Donders was born on May 27, 1818, in Tilburg, Holland. He was the only son and the youngest in a family of nine children, whose father, a merchant, died soon after his birth, leaving the family poorly provided for. He was sent to school in Duizel, a small village near Tilburg, where he attracted attention through his unusual intelligence, and where at the age of eleven he was employed as an assistant teacher. At the age of thirteen he entered and remained for three years at the monastery in Boxmeer, for his mother planned he should become a priest. Here he acquired command of the Latin language, a love of scholarship, spiritual and aesthetic development, and a desire for knowledge. The splendid mental discipline acquired through this Latin teaching accounted for his later mastery of English, French, and German.

In 1835 he became a student at the Military-Medical School, and at the same time studied medicine at the Uni-

versity in Utrecht In 1840 he took the examination for the degree of doctor of medicine in Leyden, because the faculty in Utrecht would not give him credit for certain practical work he had done for two years in the military school The same year he received his doctorate from the faculty of Leyden on the thesis *Dissertatio Inauguralis Sistens Observationes Anatomico-Pathologicas de Centro Nervoso* This dissertation was based on two cases of acute cerebral meningitis, and was notable for its precision, the completeness of the clinical observations, and the thoroughness of the autopsy examinations In this work Donders gave a classic description of spinal meningitis Histologic studies, however, were not included in the thesis, for the microscope was just coming into use in pathologic investigations

Donders graduated at a time in medical history when the foundation of modern scientific medicine was being laid Henle, who later became Donders' close friend, had published the results of experiments on epithelium only three years earlier, and it was in 1841 that his great work, "Allgemeine Anatomie", his first treatise on microscopic histology appeared Johannes Muller's monumental work on tumors was published in 1838, and his great work on physiology was just completed The discoveries of Schleiden and Schwann date from 1838, and it was about this time that von Baer, Bischoff, Charles Bell in neurology, and many others, were announcing their discoveries The great schools of physiology of Johannes Muller, and of Magendie were preparing the giants Helmholtz, du Bois Reymond, Brücke, Ludwig, Vuchow, and Claude Bernard It was in the company of these investigators that Donders took his place, to become a close friend of each

At the age of twenty-four he was called to Utrecht to join the faculty of the reorganized Military-Medical School, to teach anatomy, histology, and physiology His industry and modesty attracted the attention of Mulder, who was then compiling his famous and first book on physiologic (organic) chemistry According to Moleschott, philosopher and physiologist at the University of Rome, Mulder was one of the first, if not the first, who recognized that

the study of metabolism concerns not the chemical composition of the organs, but of the tissues and their constituent parts. Donders joined Mulder in his studies on the chemistry of tissues, and then followed his first original contributions.

Schwann and Henle were applying acetic acid and water to tissues in their experiments, and were amazed when informed of the daring of Mulder and Donders. Moleschott said, "I can still see the incredulous astonishment on Henle's face when I told him, in 1844, that Mulder and Donders were busy applying lye and sulphuric acid to the tissues, one after another."

Their new and extensive experiment was conducted precisely and logically, and the proper classification of tissues and their constituent parts, theories held by Virchow and others, originated in part in the microscopic experiments of Donders and Mulder. During this work Donders with two others began to publish the "*Nederlandsch Lancet*." At this time his lecture on animal body heat was published. He explained the balance which exists between the generation of heat and the cooling mechanism of the skin. He gave also a clear definition of the principles of the conservation of energy.

Moleschott described an evening when he first met Virchow in 1847 at Henle's home in Heidelberg. Virchow was returning from a trip to Holland where he had met Donders and Mulder, and was most enthusiastic in his praise of these energetic workers, and predicted the epoch making results which were to follow.

Besides the original work which was coming from Donders' pen, there were also translations of excellent German books. Stromeyer's *Surgery*, and Ruete's *Ophthalmology*. During 1847 there appeared six papers, three of these on ophthalmic subjects. These contributions indicated his capability, and assured his future. He was gaining recognition, not for his genius alone, but for his quiet, tireless industry as well.

Then in 1847 Donders was appointed professor on the medical faculty of the University of Utrecht. This appoint-

ment came to him though there was no position open at the time. The faculty and the government realized that a man of such unusual ability should be secured for the university. On January 28, 1848, he began his work in his new position with an address entitled "The Harmony in Animal Life, a Revelation of Laws." He promptly established a small laboratory and continued his labor. Papers on various subjects followed. In 1848 appeared his paper on "The Use of Prismatic Lenses for the Treatment of Squint" and papers on the physiology of the eye and on general physiological subjects.

In these early years at Utrecht he taught six different subjects, among them physiologic optics. This he taught so well that his friends urged him to devote himself to practical ophthalmology. A physician from Cape Colony, van der Bijl, together with Sir James Simpson of Edinburgh, induced him to go to London in 1851 to study under Bowman and Guthrie. Donders was persuaded to take up this special study, for he was unwittingly and without adequate preparation, developing a practice in ophthalmology.

Donders arrived in London during the First International Exposition. There he met the physiologist ophthalmologist Bowman, the great eye surgeon Frederick von Jaeger, and the immortal Albrecht von Graefe. Already known by his works on the physiology of the eye, he was received by them with open arms. They introduced him in the hospitals of the great capital and encouraged him to carry on his scientific research in ophthalmology, and to apply himself practically. From then on an intimate and touching friendship united the three greatest ophthalmologists of the epoch, Donders, Bowman, and von Graefe. The frequent visits together and the cooperation of these three men instantly placed the specialty of ophthalmology in the first rank of medical science. At this time Donders developed other lasting friendships, Sharpey and James Paget corresponded with him through the following years.

Years later Donders referred to this fateful meeting when he received the delegates of the Royal Society at his Jubilee in Utrecht. I found this paper among the many



Sir William Bowman and Cornelis Donders

of Donders which I have. It is a fine example of his English composition, and reveals something of the spirit of the man. The delegation addressed was headed by Sir Joseph Lister, representing the Royal Society, by Hughlings Jackson of the Physiological Society, and Jonathan Hutchinson of the Ophthalmological Society of London. He addressed Sir Joseph Lister.

"My dear friend, I am deeply moved by the courtesy of the Royal Society, which has decided to send me its compliments and congratulations on this day by means of special delegates. And I am exceedingly happy that you, my dear Sir Joseph, are one of those delegates.

It is now almost forty years ago that I visited England for the first time, and it is to that visit that I owe two friends who have since been brothers to me on the path of life. Albrecht von Graefe, the younger of the two, a visitor to England as I was myself, and William Bowman, our mutual friend. Graefe passed away many years ago after a short but brilliant career, Bowman, the elder one, remains to the present day my most intimate friend, and I regret that he has been prevented from coming, as he wished to have done. But even if I cannot press his hand today, still I recognize it in the numerous tokens of sympathy from England, and also in the delegation of the Royal Society.

Let me thank you, my dear friend, for having accepted to be one of the delegates, and allow me to repeat to my countrymen here assembled, that in you we have amongst us one of the great benefactors of mankind.

I would kindly request you to be the interpreter to the Royal Society of my sincere gratitude for the honor which the Society has done to one of her humblest members" (Donders was a member of the Royal Society of London).

Furnished with letters from von Graefe, who had recently left Paris, Donders went from London to Paris to study under Sichel and Desmarres. In Paris he was elected an honorary member of the "Société de Biologie", and joined the circle of the younger Parisian physiologists, which included Claude Bernard, Charles Robin, Brown-Sequard, and Lebert.

In 1851, just a quarter of a year after Helmholtz had invented the ophthalmoscope, Donders returned to Holland and began to practice as an oculist in Utrecht at the age of 33. It was partly necessity, happily for mankind, that drove him to take this step, for his salary as professor was too small for the support of his family.

The moment was propitious for his advent in the practice of ophthalmology. Clinicians, such as Beer, Desmarres, Sichel and Arlt, had already advanced far the art of curing external affections of the eye. With the ophthalmoscope Helmholtz had just made accessible the interior of the eye to the general physician as well as the specialist. At this time, too, Helmholtz made known in full the dioptric mechanism of the eye and introduced the new science of physiologic optics.

In 1855 Donders became co editor with von Graefe and von Arlt of the *Archiv für Ophthalmologie*, which von Graefe had begun the year before.

During the next ten years he produced many brilliant papers on general physiological as well as ophthalmological studies. Contributions to our knowledge of the formation of blood and lymph appeared. There were studies on intestinal function and the digestion of fat. He produced a textbook on physiology which was used in many countries. But his attention became more and more centered on the eye. There were many papers on observations with the ophthalmoscope in the normal and abnormal eye, and on observations in animals' eyes. In 1858 he wrote two epoch making papers on the use and selection of spectacles. He presented systematic methods of refraction, and gave indications for the use of spectacles.

In 1862 he succeeded his former teacher, Schroeder van der Kolk, as professor of physiology in the University of Utrecht. It was in this year that he produced the celebrated monograph on "Astigmatism and Cylindrical Lenses." Astigmatism was recognized in 1793 by Thomas Young, and he had had a cylindrical lens ground to correct it. Geisen in 1810 attributed astigmatism to irregular curvature of the cornea. The name was given to the condition

in 1827 by Any, the astronomer. But it remained for Donders to make known how frequent and important these errors are, and how they were to be corrected. Systems, or trial sets of cylindrical lenses, then came into use. In 1864 Donders wrote

"As the ophthalmoscope is important for the objective diagnosis of defects of the eye, so is a collection of spectacle-glasses for their subjective investigation. Such glasses are indispensable for the determination not only of anomalies of refraction and accommodation, but also of the accuracy of vision, so that without them an examination of the functions of the eye is impossible."

One of Donders' contemporaries wished, in his enthusiasm, to attribute everything, even the discovery of astigmatism, to the illustrious master. Donders corrected him, "Pardon me, my friend, astigmatism was known long before me, I have only discovered those afflicted with astigmatism."

The next year papers appeared on the cause of strabismus, anomalies of refraction and their consequence, the determination of focal distance of lenses, the amplitude of accommodation, and on his invention, the ophthalmotonometer. In the year 1864 appeared his magnum opus, "On the Anomalies of Accommodation and Refraction of the Eye", which was printed first in English by the New Sydenham Society. In the *Archives of Ophthalmology* for January, 1934, Harry Friedenwald wrote, referring to Donders' works on astigmatism and on refraction, "These works produced a revolution in the attitude of the medical profession to the problems of refraction. The work on 'Refraction and Accommodation' appeared in 1866 in German, and later in other languages and met with universal acceptance. It is one of the ophthalmologic works which deserves to be called classic in the sense that its value is enduring."

This work should be read by every practitioner of ophthalmology today. It contains Donders' explanation of astigmatism, his definitions of aphakia and hypermetropia, his sharp distinctions between myopia, hypermetropia, and

presbyopia, his views on hypermetropia with excessive convergence, and resulting convergent strabismus, of myopia and divergent strabismus, of the ciliary muscle as the only muscle of accommodation and of its effect on the lens, and of asthenopia as the result of anomalies of refraction or muscular insufficiency

Edmont Landolt wrote, "One does not really know what he should admire most the multitude and correctness of his observations, the wealth of his ideas, or the exactness of his experiments I should like to know where work exists written on subjects as difficult as the physiologic optics of Helmholtz and the 'Anomalies' of Donders, which posterity has added so little to, or changed so slightly"

These remarkable works drew to the master of Utrecht both patients and pupils They were equally well received The need of a hospital for the former and a laboratory for the latter became urgent The name of Donders was gaining in international fame, and he was so well esteemed in his own country that he had only to make known the need, and donations poured in from all sides In 1859 he founded the Netherlands Eye Hospital, which he developed for the indigent and poor into a world-famous eye clinic Herman Snellen, an ingenious clinician and clever surgeon, became Donders' right hand in the hospital, and later in 1877 his successor in the chair of ophthalmology

A new laboratory built and equipped according to Donders' wishes was opened in 1866 Theodore Engelmann later professor of physiology in the University of Berlin, became his co worker, assistant, and successor in the chair of physiology, and worthily replaced him whose work he continued and completed Contributions poured forth from this hall of science to attract the attention of the medical world

Donders was sought after to succeed Helmholtz at Bonn, but in place of accepting the attractive offer, he created at Utrecht a course in physiology and in the sciences applied to ophthalmology Medical men and ophthalmologists the world over went to Utrecht to study under the great

master, and returned home to become masters. Ophthalmologists everywhere prided themselves on becoming, for a time at least, pupils at Utrecht.

Donders had many students from America who subsequently became this country's foremost ophthalmologists. Hasket Derby of Boston, and Ezra Dyer of Philadelphia, companions in Utrecht, were careful students of Donders. They returned to America to become pioneers in refraction. In 1863 Derby reported four patients with astigmatism, which he had corrected with lenses ground for them in Berlin. Other outstanding students of Donders were Henry D. Noyes, Cornelius Agnew and Herman Knapp of New York, John Green of St. Louis, and Charles Oliver of Philadelphia. Henry W. Williams of Boston, and William Thomson of Philadelphia were intimate friends of Donders.

Until 1883 contributions came sparkling from Donders' pen on general physiologic studies as well as on subjects relating to vision. His work on the physiology of speech is of great importance. One of his most important contributions to physiology was the first measurement of the reaction time of a psychical process, published in 1868. According to Landolt, there is not a spot in the vast science of physiology in which Donders has not left definite marks of his work. The life of tissues, the circulation of the blood, the digestion, the secretions, the organs of the senses, speech, functions of the nervous system, were explained in turn.

Donders' work in physiology made him a figure of equal importance with von Helmholtz, Virchow, Carl Ludwig, du Bois Reymond, Claude Bernard, and others, in the development of medical science in the latter half of the nineteenth century. Donders had a fairly constant correspondence with most of these celebrated scientists. Many letters from these great immortals to Donders are in our collection.

There was no end to the honors which came to Donders. Perhaps none delighted him more than the tributes of his disciples. In 1872, when he had finished 25 years of teaching in the University of Utrecht, his former pupils fêted him with honors and gifts, tokens of esteem and love. He was made honorary member of many of the physiological

and ophthalmological societies of various countries of Europe and America. He was knighted by several kings. Napoleon III saw fit to honor him. He received the LL.D. degree from Cambridge and honorary degrees from a host of other universities. The von Graefe medal was given to him.

Appreciation was shown by his contemporaries in medicine. One day the great master went to the house of Critchett, at London, whose hospitality had become famous. When the celebrated English practitioner returned from his consultations, a little late for dinner, he said to Donders with his always good natured smile, "My dear friend, you think you are my guest, I am rather yours, and what is more, you are my debtor."

Then finally, in 1888, it came time for his retirement from the professorship in the university. The law of Holland requires the retirement of professorial men who reach seventy. It seemed at the time that the law might be relaxed in Donders' favor, for he was in splendid health, and gave promise of having many fruitful years before him. This automatic cessation from labor seemed a great loss indeed to his students. Donders, however, planned to continue his work.

To honor his retirement, a great festive occasion was held, beginning May 27, 1888. This great Jubilee was attended by hundreds of men of all ages from every nation, and from every social position. Delegations were sent from many countries to represent their various medical societies. A huge fund (£35,738 20) was built up and given to Donders, to be known as the Donders Fund, to be used as he should designate for the advancement of medical science in Holland. A Donders volume of original contributions was published. Many gifts were given to him. Telegrams of congratulations and esteem from the world's great medical men who could not attend, were received. No greater deference could have been shown to one to whom we are all indebted.

Hardly three months after the medical men of the world had given their tributes and expressions of esteem at the

Jubilee, Donders became ill. The following article, reporting his illness, appeared in the *Lancet*, March 23, 1889

Illness of Emeritus Professor Donders

"Profound regret is caused through the medical world by the announcement of the grave illness of this eminent Dutch physician, and ophthalmologist. At his recent Jubilee, when, as we have already indicated, he had retired from academic work for no other reason than compliance with the consuetudinary law of universities in Holland, by which no professor can occupy a Chair after his 70th year, he looked as if his active life was to be extended far beyond the term of the Psalmist. On the festive occasion referred to, he seemed as young in years as in energy and spirit, and it was even suggested that the hard and fast regulation that deprived Utrecht and Holland of his services might, by statutory provisions be relaxed in his favor. But *dis aliter visum!* Apoplectic seizures of progressively increased gravity have left his physical and mental powers so impaired that all hope of his restoration to health has now been abandoned. First, his memory, then his power of sustained attention, finally reason itself, all have gone, and one of the clearest and strongest intellects ever devoted to medicine is now sunk in dementia. He has moments—so we learn from one who is near and dear to him—of acute physical pain, so acute, indeed, as to mitigate the poignancy of the conviction that his end is now so near."

One day later, March 24, 1889, he was dead.

Professor Donders was a man of commanding presence, lofty stature, dark complexion, rugged features, with bright, kindly eyes, and a sprightly manner. It is said that he attracted attention wherever he went, partly through his tall, strong figure, his penetrating eye, his whole appearance, but chiefly through what he said, for his general knowledge was vast.

"He was highly accomplished, speaking English, French, and German like a native, yet modest to the point of diffidence. His earlier military avocations gave him a polished

tenue, which, with his natural personal charm, made him known all over Europe as one of the most attractive specialists of his time"

Edmont Landolt, who was at one time a student of Donders, wrote "He possessed all the qualities which make a perfect professor an erudition as profound as extensive, an excellent memory, an intelligence capable of putting himself within the understanding of his listeners, a mind which colored abstract matters, versatility of speech, a sonorous and flexible voice, noble and significant gestures Something sublime emanated from this great and fine man, something at the same time imposing, captivating and sympathetic great knowledge, and a great desire to give knowledge"

In 1922, long after his death, the Donders monument was dedicated in Utrecht The war prevented the building and unveiling of this memorial in 1918, which was intended to commemorate the 100th anniversary of his birth More recently than this the name of Donders has been honored in Holland Last year an issue of stamps was dedicated to him Today every student and practitioner of ophthalmology the world over is acquainted with his great name and daily practice principles taught first by this illustrious physician

In conclusion I must state that the chief authorities which I have consulted are the short autobiography of Donders published in *Het Jubileum van F. C. Donders*, the paper written by Doctor E. Landolt and published in the *Arch. d'Ophthalmologie* in 1888, the speech by Dr. C. A. Peelharing delivered at the unveiling of the monument in 1922, and the many obituary notices Authority for linking the names of many of his contemporaries with Donders comes from the many letters of these contemporaries to him, which are in my possession I am indebted to Frau Professor Paul Kraus of Dresden, granddaughter of Donders, for the illustrations My sources for the short introductory sketch of the history of Dutch medicine were Garrison's great work, and the works of Charles Singer, Billroth, and Gorton

ELEVENTH SERIES
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NOVEMBER 6

The early diagnosis and treatment of hypertensive cardiovascular disease

This lecture deals with the possible causes of vascular disease with hypertension, including such factors as heredity, environment and personality. Report is given of clinical studies of apparent initiating factors. An attempt is made to name the earliest manifestations of the disease both functional and organic. The development of symptoms and physical signs, the rate of their progression and their bearing upon prognosis are discussed, as are prevention and treatment.

W W HERRICK, *Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University*

NOVEMBER 13

The Gallbladder Problem

The frequency of gallbladder disease, the etiology of gallbladder disease, modern methods of diagnosis, the problem of the stoneless gallbladder, newer studies on the etiology of gallbladder disease, application of our knowledge to the handling of this problem.

MARTIN E REHFUSS, *Clinical Professor of Medicine, Jefferson Medical College*

NOVEMBER 20

Bullkley Lecture The curability of cancer of the tongue by modern therapeutic methods

The basis for this study is a series of 322 consecutive cases of cancer of the tongue admitted to the Memorial Hospital between the years 1927 and 1931. These cases are analyzed from the standpoint of etiology, differential diagnosis, clinical course and prognosis. The five-year cure rate of this group in all stages of the disease was 26 per cent. This study endeavors to point out how the various treatment methods now available may be combined to the best interest of the patient with cancer of the tongue.

HAYES E MARTIN, *Attending Surgeon, Memorial Hospital*

DECEMBER 4

Acute inflammation of the gall bladder and the biliary ducts

There will be discussed the factors causing acute cholecystitis, both of the calculous and non-calculous type, the relation of acute and chronic inflammation, the role of infection both in cholecystitis and cholangitis, the symptomatology of the typical case and the variations which may make diagnosis difficult, the differential diagnosis from other abdominal lesions, the question which is still quite controversial as to when operation should be performed for acute cholecystitis, and the mortality and causes of death following operation on the gall-bladder and ducts

JOHN DOUGLAS, *Attending Surgeon, St Luke's Hospital*

DECEMBER 11

Rational symptomatic drug therapy

General indications for and methods used to evaluate results of symptomatic treatment. A discussion of the action, uses and possible dangers of some drugs recently introduced for the relief of symptoms

ARTHUR C DeGRAFF, *Samuel A Brown Professor of Therapeutics, New York University College of Medicine*

DECEMBER 18

Common gastro intestinal diseases of infants and children

The more common gastro-intestinal diseases of infants and children will be discussed. The causes and treatment of various types of vomiting such as pyloric spasm, stenosis and vomiting due to errors in feeding will be reviewed. The classification and treatment of infantile diarrhoea including the management of dehydration and acidosis which frequently complicate this condition will be presented

ADOLPH G DeSANCTIS, *Director of Pediatrics, New York Post-Graduate Medical School and Hospital*

1937

JANUARY 8

Gonorrhea in the Male and its treatment

A discussion of the salient points at play in the disease itself and a consideration of its treatment in the light of our recent therapeutic struggles

P S PELOUZE, *Assistant Professor of Urology, University of Pennsylvania*

JANUARY 15

Recent advances in the treatment of chronic arthritis

A brief review of the present generally accepted ideas as to the classification of chronic arthritis will be presented with a brief discussion of the most important points in differential diagnoses. An attempt will be made to evaluate the various methods of treating arthritis and special reference will be given to the more modern methods of treating this disease.

R. GARFIELD SNYDER, *Chief of the Arthritis Clinic, Hospital for the Ruptured and Crippled*

JANUARY 22

Recent advances in the endocrine field

A discussion of recent advances in the study of internal secretions, with especial reference to their bearing on the interpretation of symptoms in the field of general medicine.

DAVID P. BARR, *Professor of Medicine, Washington University*

JANUARY 29

Angina pectoris and coronary artery disease

This lecture will consider the nervous and mental influences in angina pectoris, etiologic factors in coronary artery disease, with special consideration of the role of hypertension, diabetes and other metabolic disorders, mechanism of pain production, classification of cases, differential diagnosis both of angina pectoris and coronary artery occlusion, prognosis, life expectancy, treatment, including a consideration of more recent forms of treatment, such as paravertebral block, sympathectomy, thyroidectomy, undernutrition and surgical treatment.

B. S. OPPENHEIMER, *Physician to Mount Sinai Hospital*

FEBRUARY 5

The treatment of chronic Bright's disease and uremia

Theoretical and practical aspects of medicinal, dietary, and surgical treatment of chronic Bright's disease and uremia will be discussed.

IRVING H. PAGE, *Associate Member of The Rockefeller Institute*

FEBRUARY 19

The fundamental principles of fever therapy in the treatment of infectious disease, particularly gonococcal infections

Gonococcal infections offer the clearest illustration of the use of fever therapy as a curative agent in infectious disease. The organism may be cultured from the patient and tested for its resistance to a temperature of 41.5°C . The patient can be given the same length of fever at this temperature as indicated by the test upon the patient's own culture (thermal death time) with a fair expectation of cure. The success or failure of the treatment can be demonstrated clinically and bacteriologically very quickly. An intensive study of this disease has made it possible to formulate some of the fundamental principles which are perhaps relevant to certain other diseases. There is some confirmatory evidence both experimentally and clinically that the same principles may be applied in late syphilis. The metabolic disturbances produced in the body of the patient as a result of the prolonged fever (up to 27 hours at 41.5°C) resemble in many instances those occurring in spontaneous fevers.

STAFFORD L. WARREN, *Associate Professor of Medicine, The University of Rochester*

FEBRUARY 26

Modern concepts of anemia from the clinical standpoint

Experimental studies and the dynamic point of view—Minot's discovery of liver treatment as elucidating pernicious anemia—the correlation of studies of the peripheral blood and of hemolytopoietic tissue (especially with sternal biopsies) as permitting not only more insight into the nature of the diseases but also a more intelligent study of individual human cases. In regard to classification, the old primary and secondary arrangement is obsolete both because many of the primary diseases have shifted or disappeared, and the second was always a dump heap containing many different types. Some of these would be briefly considered. The use and limitations of the classification based on size of the erythrocyte will be touched upon.

EDWARD B. KRUMBHAR, *Professor of Pathology, University of Pennsylvania School of Medicine*

MARCH 5

Deficiency disease, its physiology, diagnosis, and treatment

The clinical and experimental evidence upon which our understanding of various disease states as deficiencies is based, the symptomatology, the diagnosis, and the treatment of these frequently occurring and poorly understood clinical conditions

C P RHOADS, *Associate Member of the Hospital of The Rockefeller Institute for Medical Research*

MARCH 12

Neurology and Psychiatry—their common interests and some divergent trends

Relationships General survey and evaluation of the possibilities in neuropsychiatry—trends in both neurology and psychiatry and special points converging into so-called “neuropsychiatry”

NOLAN D C LEWIS, *Professor of Psychiatry, College of Physicians and Surgeons, Columbia University*

MARCH 19

Carcinoma of the lung

A discussion of the pathological changes, signs and symptoms, diagnostic methods, and treatment

WILLIAM F RIENHOFF, JR., *Associate Professor of Surgery, Johns Hopkins University Medical School*

APRIL 2

The diagnosis and management of the commoner clinical allergies

There will be a preliminary discussion of the various types of allergy. A correct diagnosis of the cause or causes is essential to proper treatment. An evaluation of the general and special procedures to accomplish such diagnoses will be given. Present methods of the general management and specific treatments for hay fever, asthma and angioneurotic edema will be considered in detail.

ROBERT A COOKE, *Assistant Professor of Clinical Medicine, Cornell Medical College*

APRIL 9

A study of four hundred cases of pulmonary tuberculosis

Analyzed with respect to the type and extent of the lesions in the lung prior to treatment, the therapeutic measures employed, the clinical results obtained and the present status of the group after a minimum period of three years

GEORGE FOSTER HERBEN, *Physician in Chief, Loomis Sanatorium*

APRIL 16

Recent advances in physical therapy

A discussion of hydro-gymnastics in the treatment of infantile paralysis, muscle re-education in spastic paralysis, pressure-suction treatment in peripheral circulatory disturbances, hyperpyrexia therapy, short-wave and ultra short-wave therapy, and auto-transfusion with ultra violet radiation

K G HANSSON, *Director of Physical Therapy, Hospital for the Ruptured and Crippled*

APRIL 23

The management of difficult labor

EDWARD A SCHUMANN, *Professor of Obstetrics, School of Medicine, University of Pennsylvania*

CORRECTION

On page 505 of the August 1936 *Bulletin* an error was made in listing Dr S A Knopf's book, *Heart disease and tuberculosis*, as privately printed. The book was published by the Livingston Press of the Pott's Memorial Hospital for the Rehabilitation of the Tuberculous.

REPORT OF COMMITTEE ON LECTURES TO THE LAITY

The Committee on Lectures to the Laity desires to present a report of its activities, with a brief history of its inception and development

The New York Academy of Medicine has always taken an active interest in the diffusion of medical knowledge among the medical fraternity. Its meetings have increasingly been the centers for the exchange of professional experience and the announcement of new discoveries. Its library has been a beehive of intellectual activity by physicians. On the other hand, the Medical Information Bureau has developed a relationship with the general public through its newspaper and radio releases. Fellows of the Academy have gladly offered their knowledge and services for the dissemination of information about such phases of medicine as the public wishes and should know.

From this it was but natural that the Bureau should address itself to the public through lectures to the laity. The public has long heard about the cure of this or that disease, but it has rarely been told the authoritative facts on the history and romance of medicine. This subcommittee was organized to develop and put into practice this concept. After numerous meetings, it was agreed to hold a laity meeting once a month in the evening in Hosack Hall at the Academy, for eight months. Fellows of the Academy and distinguished physicians elsewhere were invited to deliver lectures. A cordial response was made and speakers of high merit were obtained.

The attendance has been large, so that standing room only could be obtained, and many had to be turned away. The audience, through the cooperation of the New York City Board of Education, has contained many school teachers. This has been of importance because of the inevitable spread of this knowledge to their pupils. Furthermore, publishers have been interested and the entire series of lectures will be published by D. Appleton Century Co., Inc., in book form and in this way a much larger audience may be reached.

In this endeavor, it is fitting to acknowledge the gracious cooperation of the Board of Education of the City of New York, notably, Dr Harold G Campbell, Superintendent of Schools, Dr Joseph Sheehan, Associate Superintendent and Dr I H Goldberger. Also acknowledgment is to be made to the Academy's Committee on Medical Education, four of whose members, Doctors Shattuck, Tenney, Bancroft and Reynolds, served on this committee.

Our special thanks is due to Dr Olin Sage Wightman, whose contribution of \$200.00 enabled us to initiate and promote the Lectures to the Laity promptly and effectively.

The committee submits this brief report of its activities with the recommendation that the Lectures to the Laity be continued and that a committee be reappointed for that end.

The committee wishes to express its deep appreciation of the splendid work performed in the development of the idea and in its consummation by our Executive Secretary, Dr Iago Goldston.

(Signed) DR WILLIAM CRAWFORD WHITE
*Chairman, Subcommittee Lectures
 to the Laity on the Art and
 Romance of Medicine*

RECENT ACCESSIONS TO THE LIBRARY

("Possession does not imply approval")

- Abbott, M E S Atlas of congenital cardiac disease
 N Y, American Heart Assoc, 1936, 62 p
- Andresen, V & Haupl, K Funktionen-Kieferorthopädie
 Leipzig, Meusser, 1936, 116 p
- Akrovd, W R Vitamins and other dietary essentials 2 ed
 London, Heinemann, 1936, 226 p
- Bretzner, W Sport- und Arbeitsschäden
 Leipzig, Thieme, 1936, 136 p
- Bailey, F R Text-book of histology 9 ed
 Baltimore, Wood, 1936, 773 p
- Bolduin, C F and Bolduin, N W Public health and hygiene 2 ed
 Phil, Saunders, 1936, 371 p

- British (The) encyclopaedia of medical practice, under the general editorship
of Sir H Rolleston
London, Butterworth, 1936, vol 1
- Brockbank, E M The foundation of provincial medical education in Eng
land, and of the Manchester school in particular
[Manchester, Eng], Manchester Univ Press, 1936, 191 p
- Cattell, R B A guide to mental testing
London, Univ of London Press, 1936, 312 p
- Cemach, A Luftwege, Mund und Ohr
Wien, Maudrich, 1936, 132 p
- Hammond, T E Vitality and energy in relation to the constitution
London, Lewis, 1936, 314 p
- von Hoesslin, H Vorlesungen uber Erkrankungen des Respirationssystems
Leipzig, Thieme, 1935, 150 p
- Hopkins, G H E Mosquitoes of the Ethiopian region
London, British Museum, 1936, vol 1
- Howell, W H A text-book of physiology 13 ed
Phil, Saunders, 1936, 1150 p
- von Jaschke, R T Lehrbuch der Geburtshilfe 4 Aufl
Berlin, Springer, 1935, 770 p
- Kahn, R L Tissue immunity
Springfield, Ill, Thomas, [1936], 707 p
- Kemp, T Prostitution, an investigation of its causes
Copenhagen, Levin, 1936, 253 p
- Kovács, R Physical therapy for nurses
Phil, Lea, 1936, 286 p
- Lewis, M M Infant speech
London, Paul, 1936, 335 p
- Lewis, (Sir) T Vascular disorders of the limbs
London, Macmillan, 1936, 111 p
- Licht, R Die biotechnische Behandlung von Spaltbildungen und Defekten
der Gaumenorgane
Munchen, Verlag des Reichsverbandes deutscher Dentisten, 1936,
112 p
- Linstead, H N Poisons law
London, Pharmaceutical Press, 1936, 444 p
- Lloyd, W E B A hundred years of medicine
London, Duckworth, [1936], 344 p
- McGehee, W H O A text-book of dental pharmacology, materia dentica
and pharmaco-therapeutics
Phil, Blakiston, [1936], 489 p
- M'Gonigle, G C M & Kirby, J Poverty and public health
London, Gollancz, 1936, 278 p
- McKillop, M Food values [4 ed]
London, Routledge, 1936, 155 p
- Mercer, W Orthopaedic surgery 2 ed
London, Arnold, [1936], 906 p

- Muir, (Sir) R Text-book of pathology 4 ed
Balt, Wood, 1936, 994 p
- Nystrom, E G Lectures on embolism and other surgical subjects
Balt, Williams, 1936, 213 p
- Parsons, (Sir) J H Diseases of the eye 8 ed
London, Churchill, 1936, 705 p
- Pennell, V C A handbook of urology
Cambridge [Eng], Univ Press, 1936, 224 p
- Reichel, F P Die Nachbehandlung nach Operationen 3 Aufl
Munchen, Bergmann, 1936, 499 p
- Richtlinien fur Schwangerschaftsunterbrechung und Unfruchtbarmachung
aus gesundheitlichen Grunden Hrsg von der Reichsarztekammer
Munchen, Lehmann, 1936, 180 p
- Robson, G C & Richards, O W The variation of animals in nature
London, Longmans, [1936], 425 p
- Sachs, W The vegetative nervous system
London, Cassell, 1936, 168 p
- Savory, T H Mechanistic biology and animal behaviour
London, Watts, [1936], 182 p
- Schumann, E A A textbook of obstetrics
Phil, Saunders, 1936, 780 p
- Shoenfeld, D D The crime and the criminal, a psychiatric study of the
Lindbergh case
N Y, Covici, [1936], 411 p
- Skinner, E W The science of dental materials
Phil, Saunders, 1936, 411 p
- Sloan, E P The thyroid, surgery, syndromes, treatment
Springfield, Ill, Thomas, [1936], 475 p
- Sollmann, T H A manual of pharmacology 5 ed
Phil, Saunders, 1936, 1190 p
- Somogyi, J Begabung im Lichte der Eugenik
Leipzig, Deuticke, 1936, 518 p
- Stopes, M C C Change of life in men and women
London, Putnam, [1936], 282 p
- Thoma, K H Oral diagnosis and treatment planning
Phil, Saunders, 1936, 379 p
- Uhlenbruck, P Die Herzkrankheiten im Rontgenbild und Elektrokardiogram
Leipzig, Barth, 1936, 318 p
- Waal, E Studies on the dissociation of the dysentery bacilli
Oslo, Dybwad, 1935, 176 p
- Zeller, W Aufgaben und Methoden des Jugendarztes
Leipzig, Barth, 1936, 172 p

DEATHS OF FELLOWS OF THE ACADEMY

GREENWALD, MAX, M D, 24 West 59 Street, New York City, graduated in medicine from the University of Maryland in 1907, elected a Fellow of the Academy November 3, 1927, died October 1, 1936

Dr Greenwald was attending physician to the Metropolitan and Beth David Hospitals

He was a Fellow of the American Medical Association and a member of the County and State Medical Societies

HOWLAND, DE RUYLER, M D, Stratford, Connecticut, graduated in medicine from Columbia University, College of Physicians and Surgeons in 1906, elected a Fellow of the Academy January 7, 1915, died September 12, 1936
Dr Howland was also a Fellow of the American Medical Association

MUNGER, CARL EUGENE, M D, 85 Grove Street, Waterbury, Connecticut, graduated in medicine from the College of Physicians and Surgeons in 1893, elected a Fellow of the Academy October 6, 1892, died September 28, 1936

Dr Munger held a certificate of the American Board of Otolaryngology and was a member of the American Medical Association, the American Laryngological, Rhinological and Otolological Society and the American College of Surgeons

WILLIAMS, FRANKWON EARL, A B, M D, 44 West 12 Street, New York City, received the degree of Bachelor of Arts from the University of Wisconsin in 1907, and graduated in medicine from the University of Michigan in 1912, elected a Fellow of the Academy October 3, 1918, died September 24, 1936

Dr Williams was medical director of the Massachusetts Society for Mental Hygiene, 1915-1917, chairman of the Massachusetts Advisory Prison Board, 1916-1917, associate medical director of the National Committee for Mental Hygiene, 1917-1922 and its medical director from 1922-1931. He served as first assistant and chief of division of neurology and psychiatry in the office of the Surgeon General during the World War. He was a member of the faculty of the New School for Social Research for several years, and a lecturer in psychiatry at the Yale University School of Medicine from 1926-1929 and at the College of Physicians and Surgeons since 1930. The honorary degree of Doctor of Science was awarded Dr Williams in 1927 by Colgate University.

He was a Fellow of the American Medical Association and a member of the American Psychoanalytic Association, American Psychiatric Association, New England Society of Psychiatry, American Psychopathological Association, American Orthopsychiatric Association and the County and State Medical Societies.

Dr Williams was the editor of *Mental Hygiene* and the author of a number of books and articles on psychiatric subjects.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

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NOVEMBER, 1936

No 11

NINTH ANNUAL GRADUATE FORTNIGHT "Trauma; Occupational Diseases and Hazards" October 19 to 31, 1936 OPENING REMARKS*

EUGENE H POOL

President, The New York Academy of Medicine

The educational symposium which we open tonight is an attempt to present to the profession the advances in medicine, so that the busy practitioner may be informed from authoritative sources as to the latest thought and knowledge on a given topic. The series was instituted in 1928, and each year a subject of outstanding importance in the practice of medicine and surgery has been selected. At the evening meetings, various aspects of the subject are discussed by well known authorities. In the afternoons the hospitals of the City give clinics, which deal with practical phases of the same problem. This year the subject is Trauma, Occupational Diseases and Hazards.

It is a common observation that the simple and obvious things in life are the ones most often overlooked. This is notably true in medicine. Indeed, there is an old saying that in the search for the ichthyosaurus the common bed bug is often overlooked. The medical mind, from that in the professorial chair down to the first year student is focused upon the cause and cure of cancer, the etiology of the unexplained exanthemata, the incidence of aleukemic leukaemia and the distinction between Banti's disease and

* Delivered October 19, 1936

splenic anaemia The treatment of the common injuries is touched upon but lightly in the medical school and at surgical meetings The application of a bandage, the suturing of a wound, the care of local infections and the treatment of fractures and dislocations are relegated to a secondary place in the efforts of the teacher of surgery Yet, modern conditions have brought injuries and occupational diseases and hazards to a position of primary importance to the community The speeding up of present day activities by the various methods of modern transportation have relegated the relatively safe horse drawn vehicle of our fathers to little more than a memory Man now travels not only horizontally, as of old, but upward and downward, like moles burrowing under rivers and mountains, and birds soaring in the air Every phase of these developments, their preparation and perpetration, is attended by an ever increasing toll of accidents and deaths

With the enormous growth of industrial enterprises, injuries and occupational hazards take on increasing importance Industry is constructive in the inanimate but destructive to man The powerful implements of modern warfare have reached such refinement as to necessitate almost as many physicians and surgeons as line officers in an army

It is fitting therefore that this subject be periodically reviewed While we cannot expect to be told much that is new, we will find that much which has been forgotten will be again brought to light We are now in the same frame of mind as was Pott who wrote in 1777 "no man, however slightly acquainted with the history of Surgery, can have the smallest doubt of the superiority which its present state justly claims over that of our predecessors The surgery of the last century was coarse and cruel, painful and tedious To simplify the art has been the aim of all the best practitioners of later times"

It is striking how much of our present day "new" knowledge and methods are but refinements of what was known and practiced in the past If I may be allowed to digress, I shall cite historical evidence on this point

Dietary instructions for various conditions were laid down by Hippocrates. Gymnastics were practiced by the early Chinese and massage by the ancient Egyptians. Even in antiquity, the value of climatic treatment for pulmonary affections was emphasized and the communicability of consumption was recognized by Avicenna about 1000 A.D. The clyster was extensively employed for many diseases. Herodotus relates that the Egyptians had the habit of washing their intestines every month for the preservation of health.

Fads have always been a menace to progress. For instance, blood letting for generations was blindly practiced. Byron in his last illness opposed being bled for fever, remarking that "less slaughter is affected by the lance than the lancet, that minute instrument of mighty mischief." After Louis XIV had his rectal fistula operated upon a number of loyal Frenchmen elected to have this then fashionable operation done upon themselves.

Military exigencies have been responsible for much of the development of traumatic surgery throughout the ages. This is demonstrated in the history of the Greeks, Romans and Macedonians. What a thrill it is to review the description of the treatment of the thoracic wound of Alexander the Great. At the age of 28 he was gravely wounded by a heavy arrow which pierced his coat of mail and lodged under the right nipple. Air and blood are said to have escaped from the wound and he was near death. The historian Quintus Curtius recorded that Cristodemus of Cos sawed off the shaft of the arrow. When the armour had been removed, the arrow head was extracted through a deep incision.

The Crimean War was responsible for Florence Nightingale and the development of nursing. The recent war revolutionized traumatic surgery. It advanced the prevention of tetanus, the treatment of gas bacillus infection and the knowledge of its countless bacterial factors, debridement, closure by primary and secondary suture, effective care of wounds, notably by the Carrel-Dakin method, the treatment of shock and, finally, untold details

in the handling of fractures both simple and compound. Much of this has been forgotten. One hears decried the Carrel-Dakin method. It is just as efficient now as it was twenty years ago, if properly employed, which is rarely the case. Tetanus can always be prevented, yet we see cases in civil practice where precautions are neglected. How often the practitioner in civil life forgets to administer the anti-toxin at the time of a secondary operation following trauma. I have recently seen a death result from this omission. One does not appreciate and use sufficiently traction and suspension in complicated cases of bone lesions. In the War, the Balkan frame with its limitless elaborations was of inestimable value. I remember a young officer with knees and arms operated upon who was under a Balkan frame with suspension and traction devices running in all directions. One morning on entering the officers' ward I noticed a large sign which read "Pulley Pool, the mechanical maniac." Many modern surgeons take a similar view of such devices regarding them as in-cumbrances. Yet they have an important place in treatment.

Our theme is to be developed by eminent contributors to whom on behalf of the Officers and Fellows, I extend our deepest thanks. It is my privilege to welcome you and to offer you the facilities of the Academy. I hope you will join me in an expression of appreciation to the Graduate Fortnight Committee, the Committee on Clinics, the Committee on Scientific Exhibits, the Subcommittee on Therapeutics, and to Dr. Frederick P. Reynolds who has been Secretary of the Committee on Medical Education since April, 1924. That committee has been responsible for the Graduate Fortnight. It is with deep regret that we record the fact that this is the last "Fortnight" under the direction of Dr. Reynolds.

The Wesley M. Carpenter Lecture

HISTORICAL BACKGROUND OF INDUSTRIAL AND OCCUPATIONAL DISEASES¹

HENRY E. SIGERIST
Johns Hopkins University

It is the destiny of man that he has to work to maintain his life. He has to produce and gather the food that his organism requires and has to produce goods to protect himself against the climate and to make his life easier and more enjoyable. The greatest advance in the history of human civilization was the step from the paleolithic to the neolithic age, from the food-gathering to the food producing stage, when man had learned to cultivate plants, to domesticate animals, to perfect his tools. Man struggled with nature and he is conquering it gradually through his intelligence, inventiveness and skill. The productive forces, animate and inanimate, active and passive, man and his raw material, the laborer and his tool, were the decisive factors in history.

Man has to work in order to live—and this is good. Work gives significance to our life. It ennobles it. It allows us to create material and spiritual values without which life would not be worth living. If society progressed, it was due to the cooperative efforts of all its members. Man has a duty to work but he should also have a right to work.

Work balances our life and is therefore an essential factor of health. Yet we all know that man in the pursuit of his work is exposed to all kinds of hazards which threaten his life. This has always been the case no matter what the work was. The stone age man gathering his food, hunting animals, was subject to accidents. Neolithic bones showing traces of fractures make this evident.

With developing civilization production increased. New occupations created new hazards. The working conditions of a definite period and country represent an important

¹ Delivered October 19, 1936

criterion of a given civilization. When we look at the history of civilization from this point of view, we certainly have no reason to be proud of our past.

We are inclined to value a civilization according to its artistic achievements. We admire the pyramids and the temples of ancient Egypt which have survived the centuries and millenniums but we forget that they were built with the blood and tears of thousands of human beings. Labor in ancient civilization was primarily slave labor. The pyramids were built by state slaves whose lives had no value whatever, whom every war would replace. We still can see the Egyptian workers laboring under the whip as represented on wall paintings and in reliefs. The lot of the city workers was hardly any better and we can still perceive their voice of rebellion. Egyptian literature has preserved, besides a huge mass of religious texts written in praise of the gods, a few scraps which tell us of the hard life of the people.

I have never seen a blacksmith acting as ambassador or a foundry worker sent on a mission, but what I have seen is the metal worker at his work. He is grilled at the mouth of the furnace. The mason, exposed to all weathers and all risks, builds without clothing. His arms are worn out with work, his food is mixed up with dirt and rubbish. He bites his nails, for he has no other food. The barber breaks his arm to fill his stomach. The weaver engaged in home work is worse off in the house than the woman doubled up with his knees drawn up to his stomach, he cannot breathe. The laundryman on the quays is the neighbour of crocodiles. The dyeworker stinks of fish spawn. His eyes are tired, his hand works unceasingly and as he spends his time in cutting up rags he has a horror of clothing.²

We admire the graceful Greek bronze statuettes that fill our museums but we do not think of the copper miners providing material for these works of art, or the coal miners digging for coal to make the bronze, working ten hours in narrow galleries suffocated by heat and smoke. They were prisoners of war or convicts as a rule.

The ancient physicians, keen observers as they were, noticed the influence of certain occupations on the worker's health. A good deal of information is scattered all over the Greek and Roman literature. A case of lead poisoning was

² Papyrus Sallier, 2, 4, 6, and following

correctly described by Hippocrates³ Pliny speaks of the noxious influence of lead, mercury and sulphur on those who handled these metals⁴ The poets, Martial, Juvenal, Lucretius, reflected the views held by the layman and wrote of the dangers of certain occupations, of the diseases of sulphur workers⁵ and blacksmiths⁶, of the varicose veins of the augurs⁷ and the hard fate of the gold miners⁸ But nothing was done to protect the workers They had to help themselves as the minium refiners described by Pliny did who put membranes as a mask before their faces⁹ Medical care was given to those who served to entertain the people, the gladiators Galen started his career by being physician to a gladiator's school in Pergamon

The ancient physicians were not actually interested in the health of the manual laborers They devoted their attention almost exclusively to the upper class It is quite characteristic that Celsus believes that medicine originated with the philosophers who, having an unhealthy mode of living naturally would be interested in correcting it¹⁰ The author of the hippocratic treatise, *Peri diates*, gives special dietetic rules for such people who, having some business to attend, were not able to devote all their time and all their attention to their health¹¹ It would never have occurred to him to prescribe any definite hygiene to crafts men or workers

We must not forget, however, that ancient technology was mostly small scale technology The artisans frequently

3 Epid VI, 25, ed Littre V, 164-166

4 Nat Hist XXXIV, 50, XXXIII, 40

5 Martial, Epigr XII, 57, 14

6 Juvenal, Sat X, 130

7 Juvenal, Sat VI, 397

8 Lucretius, VI, 811

9 Pliny, Nat Hist XXXIII, 40 "Persons employed in the manufactories in preparing minium protect the face with masks of loose bladder-skin, in order to avoid inhaling the dust, which is highly pernicious, the covering being at the same time sufficiently transparent to admit of being seen through"

10 Celsus, Prohem 6-7

11 Peri diates III, 68, ed Littre VI, 594

worked in the open air, as they still do in the Orient, so that the hazards were infinitely less than in later centuries after technology had assumed larger proportions

Ancient civilization created great cultural values but it was a culture that was shared by only a small upper class and endless human lives had to be sacrificed and a great deal of suffering had to be endured to allow this culture to flourish

Hazards occurred not only in work but also in certain recreational activities Hippocratic surgery is mostly bone surgery and reflects the experiences the surgeons had in the gymnasiums where dislocations, fractures and other injuries must have been quite frequent

The Middle Ages scarcely made any contributions to the subject and it is not before the end of the 15th century that we begin to find a special literature devoted to occupational diseases

Why then? For various reasons Medicine had progressed and the physicians were keenly interested in describing new diseases But there are other, economic reasons The volume of trade had increased considerably which created a great demand for metals, particularly gold and silver for currency as a medium of exchange The voyages of discovery were undertaken not so much in the interest of science as primarily in search of precious metals Besides, fire arms were used more and more frequently which created a strong demand for iron, copper and lead The shallow mineral deposits were exhausted and it was necessary to dig deeper which obviously created increased hazards At the same time in many countries the farmers were evicted, were divorced from the means of production and became proletarians who had nothing to sell but their labor powers. Many of them went into industry

The *morbi metallici* were the first occupational diseases to attract the attention of medical writers In 1473 a German physician in Augsburg, Ulrich Ellenbog, wrote a little pamphlet of seven small printed pages, *Von den giftigen besen tempfen und reuchen* (On the poisonous

wicked fumes and smokes) Augsburg at that time was famous for its goldsmiths. Ellenbog, who apparently had such goldsmiths among his patients, noticed that some of their troubles were probably due to their working conditions. He wrote his pamphlet as a memorandum describing the dangers of fumes that developed from coal, nitric acid, lead, mercury and other metals. He advised the goldsmiths to work, whenever possible, in the open air, to cover their mouths when the fumes developed and, in the style of the time, recommended a number of drugs to be smelled as a measure of protection. Ellenbog's memorandum circulated in manuscript copies in the workshops and was printed in about 1524. It must have been very popular because only one copy of the printed pamphlet is known to exist. It was, however, reproduced in facsimile in 1927¹².

Ellenbog's was just a short memorandum. The first monograph devoted to occupational diseases is due to Paracelsus who, greatly interested in chemistry, visited many mines, particularly those of Villach in Carinthia where his father had settled to practice. He lived and worked with the miners and got first hand evidence of the appalling conditions under which they were laboring and the very serious hazards to which they were exposed.

Paracelsus' monograph is a beginning. Every writer on mining after that time never failed to touch the diseases peculiar to this industry. A very good example of this type of literature is Agricola's work, *De re metallica*¹³, published in 1556. In Book VI he says,

It remains for me to speak of the ailments and accidents of miners, and of the methods by which they can guard against these, for we should always devote more care to maintaining our health, that we may freely perform our bodily functions, than to making profits. Of the illnesses, some affect the joints, some the eyes, and finally some are fatal to men.

12 Ulrich Ellenbog, *Von den giftigen besen tempffen und reuchen*, Eine gewerbe-hygienische Schrift des XV Jahrhunderts, herausgegeben von Franz Koelsch und Friedrich Zoepff, Munich, 1927.

13 Georgius Agricola, *De re metallica*, translated from the first Latin edition of 1556 by H. C. Hoover and L. H. Hoover, London, 1912.

He then goes on describing the various hazards that threatened the miners, the abundant water often collecting in shafts making them cold and, in this way, injuring the workers, the dust that "has corrosive qualities and eats away the lungs, and implants consumption in the body, hence in the mines of the Carpathian Mountains women are found who have married seven husbands, all of whom this terrible consumption has carried off by a premature death" Stagnant air produces a difficulty in breathing The remedy is to be found in the ventilating machines Or, the air is infected with poison, causing swellings and paralysis Accidents are described as being not rare, workmen slipping from ladders in the shafts, breaking their arms, legs or necks, or falling into the sumps and being drowned Mountain slides occurred as was the case in Rammelsberg where in one day "400 women were robbed of their husbands" Venomous ants were found in several mines And finally there was one hazard that we no longer know "In some of our mines, though in very few, there are pernicious pests These are demons of ferocious aspect demons of this kind are expelled and put to flight by prayer and fasting"

Special monographs on diseases of the miners were written by several German physicians, the most important being Martin Pansa¹⁴, Leonardus Uisinus¹⁵, Samuel Stockhausen¹⁶, Suchlandius¹⁷

There is no doubt that mining was the most dangerous of all occupations and therefore was given attention first In the 17th century books began to be written on the diseases of other occupational groups They concern less the working class than the upper class, the courtiers, the scholars, men of letters in general, but then also soldiers and sailors because the fighting strength of an army or navy was determined to quite an extent by the health conditions

14 Consilium peripneumonicum, 1614

15 De morbis metallariorum, Leipzig, 1652

16 De Lythargyri fumo novo morbico , 1656

17 De paralyti metallariorum, Utrecht, 1693

A great many scattered observations on occupational diseases are found in the medical literature of the 17th century. The century of Sydenham was naturally interested in disease entities and endeavored to describe their clinical picture accurately. But the 17th century was also the century of the iatromechanists who attempted to explain the functions of the human body mechanically, who liked to compare the organs to tools and therefore were interested in tools and machines.

And then, in 1700, the Italian physician Bernardino Ramazzini published his famous book, *De morbis artificum diatriba*, of which an English translation appeared in 1705 under the title *A treatise of the diseases of tradesmen, shewing the various influence of particular trades upon the state of health, with the best methods to avoid or correct it, and useful hints proper to be mended in regulating the cure of all diseases incident to tradesmen*¹⁸—the first textbook on occupational diseases. I have just read it. It is a fine book, a real medical classic. It is to the history of occupational diseases what Vesalius' book is to anatomy, Harvey's to physiology, Morgagni's to pathology. It would be worth while reprinting the complete English translation of the book as it is not only interesting from the medical point of view but gives a very good account of the working conditions of the time¹⁹.

Ramazzini was a distinguished physician in Modena, professor at the University of this city and in 1700, the year his book was published, he was called to the University of Padua. Discussing the diseases of "Cleansers of Jakes" (chapter XIV), he tells us how he became interested in his subject.

The Accident, from which I took occasion to write this Treatise of the Diseases of Tradesmen is as follows. In this City, which is very populous for its Bigness, and is built both close and high, it is usual to have their

¹⁸ Further English editions were published 1746 and 1750.

¹⁹ Abstracts have been reprinted by Herman Goodman, New York, 1933. The original Latin text was reprinted with an introduction by F. C. Mayer (now at the Army Medical Library in Washington), in Budapest, 1928.

Houses of Office cleansed every third Year, and, while the Men employed in this Work were cleansing that at my House, I took notice of one of them, who worked with a great deal of Anxiety and Eagerness, and, being moved with Compassion, I asked the poor Fellow, Why he did not work more calmly and avoid over-tiring himself with too much Straining? Upon this the poor Wretch lifted up his Eyes from the dismal Vault, and replied, That none but those who have tried it could imagine the Trouble of staying above four Hours in that Place, it being equally troublesome as to be struck blind. After he came out of the Place, I took a narrow View of his Eyes, and found them very red and dim, upon which I asked him, If they had any usual Remedy for that Disorder? He replied, their only Way was to run immediately Home, and confine themselves for a Day to a dark Room, and wash their Eyes now and then with warm Water, by which Means they used to find their Pain somewhat assuaged. Then I asked him, if he felt any Heat in his Throat, and Difficulty of Respiration, or Head-ach? And whether the Smell affected their Nose, or occasioned a Squeamishness? He answered, That he felt none of those Inconveniencies, that the only Parts which suffered were the Eyes, and that if he continued longer at the same Work, without Interruption, he should be blind in a short Time, as it had happened to others. Immediately after he clapt his Hands over his Eyes, and run Home. After this I took notice of several Beggars in the City, who, having been employed in that Work, were either very weak-sighted, or absolutely blind.

He decided to study the diseases peculiar to other occupations. He went to the workshops, talked to the people, studied the conditions under which they worked.

The Shops, or Work-houses of Tradesmen are the only Schools in which we find any satisfactory Knowledge of these Matters, and out of these Places I have endeavoured to pick whatever might best please the Taste of the Curious, and chiefly indeed to suggest such Cautions, as may serve to prevent and cure the Diseases to which Tradesmen are usually subject.

He studied the literature on the subject and became more and more convinced that the occupational diseases played an important part in the life of a community.

We must own that some Arts entail no small Mischiefs upon the respective Artisans, and that the same means by which they support Life, and maintain their Families, are oftentimes the Cause of grievous Distempers, which hurry them out of the World. Now, having observed this frequently in the Course of my Practice, I bent all my Thoughts upon writing a Treatise of the Diseases of Tradesmen or Artificers.

He was aware of the fact that his subject was new and that such a first book could not be but an "imperfect performance" and yet he succeeded in covering the ground very thoroughly, describing the various trades and their hazards, indicating methods to prevent the diseases, or when they had occurred, to cure them. His therapy, of

course, follows the trends of the day. He is like so many of his contemporaries in Italy, an iatromechanist. But the book is full of common sense and inaugurates a new period in the history of the subject.

One other great contribution was derived from it. From then on, when interrogating a patient, the physician would ask what his occupation was. Ramazzini mentions the necessity of doing this.

When a Physician therefore is called to visit one of the poorer and meaner sort of People, I would advise him not to feel the Pulse as soon as he comes into a Room, without inquiring into the Circumstances of the Patient, nor to stand, as it were, in a transient Posture, to prescribe where the Life of Man is concerned, but to sit down by the Patient, let the Place be never so sorry, and carefully interrogate him upon such Things, as both the Precepts of our Art, and the Offices of Humanity require us to know. The Divine Hippocrates informs us, that when a Physician visits a Patient, he ought to inquire into many things, by putting Questions to the Patient and Bystanders.

To which I would presume to add one Interrogation more, namely, what Trade he is of. For though this Question may be referred to the morbid Causes, yet I reckon it very convenient, and absolutely necessary, when we have to do with the vulgar ordinary Patients. But I find it very seldom mended in the common Course of Practice, or if the Physician knows it without asking he takes but little notice of it. Though at the same Time a just Regard to that, would be of great Service in facilitating the Cure.

Morgagni in his great book, *De sedibus et causis morborum*, published in 1761, mentioned the former occupation of almost all of the cases he described.

Ramazzini gave the medical world a text book outlining a new subject. His distinction of two great groups of occupational diseases, one due to the material and one due to the labor involved, was very good indeed and was accepted by most physicians who in the following years wrote on the subject. Ramazzini's book was a mine of information often consulted during the 18th and early 19th centuries. As a matter of fact the 18th century had very little to add to what Ramazzini had said. Hecquet's *La médecine, la chirurgie, et la pharmacie des pauvres*, published in 1740 contains mere abstracts from Ramazzini, and the two most popular medical dictionaries in which occupational diseases were described took their material from Hecquet.²⁰

²⁰ Dictionnaire de Sinte, Paris, 1760—Dictionnaire de Medecine, Paris, 1772

The physicians knew how to prevent many such accidents and yet, hardly anything was done to protect the workers during the 18th century. They had to protect themselves as well as they could. At the same time, however, the industrialization of Europe progressed faster than ever before. The steam engine introduced in the textile and mining industry accelerated the development, created different working conditions and, at the same time, new hazards. Mechanical forces of high potency were brought close to man, threatening his life. In the early 19th century, beginning in England, the industrial population increased tremendously and was living and working under appalling hygienic conditions. The death rate was high and the duration of life exceedingly short. Public opinion was aroused by the report of a committee of investigation in Manchester in 1795. The ruling class recognized that a sick proletariat was a menace to its own health. Another report on "The sanitary conditions of the laboring population," published in 1838, revealed that the condition had not improved but, on the contrary, had become even worse. A very fine little book published in 1832 by a physician in Leeds, C. Turner Thackrah, on *The effects of arts, trades, and professions, and of civic states and habits of living, on health and longevity*, revealed striking figures. In the industrial city of Leeds in 1821 there was one death per 55 inhabitants, while in a neighboring rural district there was one death per 74 inhabitants. "At least 450 persons therefore die annually in the borough of Leeds from the injurious effects of manufactures, the crowded state of population and the consequences of bad habits of life," was the conclusion of Thackrah who then proceeds,

Everyday we see sacrificed to the artificial state of society one and sometimes two victims, whom the destinies of nature would have spared. The destruction of 450 persons year by year in the borough of Leeds cannot be considered by any benevolent mind as an insignificant affair. Still less can the impaired health, the lingering ailments, the premature decay, mental and corporeal, of nine-tenths of the survivors, be a subject of indifference. Nor is it in Leeds only that inquiry produces so painful a result. Leaving out of the question London and the Seaports, we might prove that Sheffield, Manchester, Birmingham, in fact, all our great manufacturing towns, exhibit

an equal or a greater excess of mortality,—and an excess increasing with the magnitude of the population. If we should suppose that 50,000 persons die annually in Great Britain from the effects of manufactures, civic states, and the intemperance connected with these states and occupations, our estimate I am convinced would be considerably below the truth. Can we view with apathy such a superfluous mortality, such a waste of human life? Assuredly an examination of our civic states and employments has long been demanded, alike by humanity and by science.

Thackeriah wrote his courageous book “to excite the public attention to the subject.” He was well aware that the upper class did not like to have this subject discussed but he was convinced that conditions could be, and must be, improved.

Most persons, who reflect on the subject, will be inclined to admit that our employments are in a considerable degree injurious to health, but they believe, or profess to believe, that the evils cannot be counteracted, and urge that an investigation of such evils can produce only pain and discontent. From a reference to fact and observation I reply, that in many of our occupations, the injurious agents might be immediately removed or diminished. Evils are suffered to exist, even where the means of correction are known and easily applied. Thoughtlessness or apathy is the only obstacle to success. But even where no adequate remedy immediately presents itself, observation and discussion will rarely fail to find one. We might even say, that the human mind cannot be fairly and perseveringly applied to a subject of this kind, without decided effect.

The work of the physicians was important but it was obvious that conditions could only be improved by way of legislation. The first Factory Act “The Health and Morals Apprentices’ Act” was passed in 1802 and was followed in the ensuing years by other acts removing some of the worst abuses, particularly in the exploitation of women and children. In spite of them conditions were still bad enough.

In France it was the report of the Prefect of Police, Dubois, of 1807 that revealed the terrifying health conditions of the industrial population. The physicians were not idle in France either. In 1822 Ph. Patissier published a French translation of Ramazzini to which he added his own observations. He recognized that as a foundation for further research, statistics should be made of the death-rate in the various occupations. He made such statistics himself for the year 1807 based on the deaths that occurred in the Paris hospitals. The relationship between death-rate and wages was clearly seen by Villermé who, later, in 1840 pub-

lished very interesting statistics. What should be done? Patissier suggested the following. First, dangerous trades should be entirely forbidden or, if this proves impossible, only criminals sentenced to death and pardoned to hard labor should be allowed to work in such trades. Second, research should be done so as to improve the working conditions by applying measures of industrial hygiene. Third, the states should have public baths easily available to the workers. Fourth, workers injured through their labor should be compensated and should have old age insurance. There were 120 Sociétés de Prévoyance, including 40,000 workers, in France in 1822. They were mutual benefit societies organized by the Société Philanthropique.

Germany was industrialized much later than England or France and it is characteristic that it was the report of a recruiting officer that drew the attention of the public to the health conditions in the working population. Traveling in the Rhine region he found the health conditions such that the army would soon be deprived of recruits. The North German Union in 1869 in its Industrial Code stated that "every manufacturer must at its own cost establish all necessary appliances for safeguarding its employees against dangers to health and life." Social insurance was inaugurated in Germany in 1883 and as it included accidents and diseases, provisions were made to give medical service to the working population.

In the United States the literature on occupational diseases began in 1837 with a dissertation *On the influence of trades, professions and occupations* written at the instigation of the New York Medical Society²¹. Factory legislation followed from the middle of the century on and developed rather slowly.

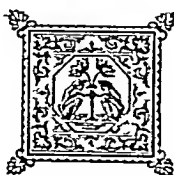
It is not until the 20th century that there was a real improvement in working conditions. The World War proved to be a strong stimulus. Workers were scarce. Their health, therefore, meant a great deal. Research was

²¹ International Labour Office. *Occupation and Health*, vol II, p. 381, Geneva, 1934.

done, chairs for industrial hygiene were established in quite a few universities, industrial clinics were opened, the first in 1910 in New York and Milan, museums were established in various countries showing the sources of industrial hazards and the way to prevent them. The most important improvements were due to legislative acts, their principles being the same in all countries: medical inspection of industrial undertakings, compulsory reporting of industrial diseases and compensation of the diseased and disabled workers. In 1906, revising the Workman's Compensation Act of 1897, England included 31 industrial diseases. This act had a great influence upon the United States.

It is obvious that the Soviet Union would pay great attention to industrial diseases and accidents. Research institutes have been created all over the Union and the health of the working population is being improved not only through measures of industrial hygiene but also through the reduction of working hours, the organization of rest and recreation and a system of socialized medicine that makes medical care available to all.

There can be no doubt that the working conditions have greatly improved in almost all civilized countries and yet, you know as well as I, that what has been achieved so far is just a beginning. In a highly industrialized society where the machine is no longer restricted to the workshop but has invaded the streets, the hazards will always be great. To reduce them to a minimum is only possible through the cooperative efforts of physician, engineer, statesman and educator.



SHOCK AND HEMORRHAGE*

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The following description of the clinical picture of shock was given by Samuel D Gross in 1872 "The person, although severely injured, congratulates himself upon having made an excellent escape, and imagines that he is not only in no danger, but that he will soon be about again, in fact, to look at him, one would hardly suppose, at first sight, that there was anything serious the matter, the countenance appears well, the breathing is good, the pulse is but little affected, except that it is too soft and frequent, and the mind, calm and collected, possesses its wonted vigor, the patient asking and answering questions very much as in health But a more careful examination soon serves to show that deep mischief is lurking in the system, that the machinery of life has been rudely unhinged, and that the whole system is profoundly shocked, in a word that the nervous fluid has been exhausted and that there is not enough power in the constitution to reproduce and maintain it The skin of such a person assumes an icterode, or sallow, cadaverous appearance, feeling at the same time doughy and inelastic, the extremities are deadly cold, the pulse makes a desperate effort at reaction, but is, at best, weak and tranquil for one who has sustained such an amount of violence The system does not seem to be conscious of what has occurred, its sensibilities are blunted, and it is incapable of suffering Nature, to use the language of Hunter, does not feel the injury" There have been advances in our knowledge concerning the mechanism of the production of shock since 1870, but this description of the clinical picture by Gross could not be improved upon at the present time

Since the World War shock has been divided grossly into two types Primary shock refers to the condition in which a decline in blood pressure is noted immediately following the receipt of an injury A satisfactory explanation for this condition seems to have been offered by Goltz in

* Delivered October 19, 1936

experiments in which it was found that the essential alteration was a vasodilatation. Secondary shock refers to the type in which the interval separating the injury and the decline in blood pressure is usually an hour or longer. It has been in an effort to explain this condition that most of the theories have been advanced. Perhaps the most divergent views have been expressed by those who maintain that shock is associated with a general relaxation of the vessels and by those who state that it is accompanied by vasoconstriction. Evidence of a convincing nature has been offered to show that secondary shock except in the terminal stages is associated with vasoconstriction. The proven facts in the case are that it is accompanied by a diminution in the blood volume and a decrease in the blood pressure. As a result of these findings, most of the theories have become untenable. During the past fifteen years, the toxemia theory has been rather generally accepted. This theory differs from the others which consider a diminution in the blood volume, vasoconstriction and capillary congestion as the essential disturbances in secondary shock in that evidence as to the initiating agent is suggested. It has in common with other theories the fact that no initiating agent has actually been demonstrated.

The most often quoted experiments that had to do with the formulating of the toxemia theory are those that were performed by Cannon and Bayliss in which shock was produced by traumatizing one of the posterior extremities of anesthetized cats. Following the death of the animals the injured and non-injured extremities were amputated by symmetrical cuts across the upper thighs, they were weighed and the difference in weight was determined. They found that there was not a sufficient difference in weight to account for the decline in blood pressure and death by the loss of blood into the injured area. Section of the spinal cord in the upper lumbar region, in some experiments, showed that the fall in blood pressure was not due to any general effect of the trauma on the circulation, brought about by nervous agencies. The decline in blood pressure

could not be explained on the basis of fat embolism, acapnia or acidosis. It was assumed that the continued fall in blood pressure was due to the absorption of some depressant substance from the injured area into the general circulation. The effects of injecting histamine and of traumatizing muscles were compared in various experiments and it was believed that the hypothetical depressant produced by injuring muscles was either histamine or some closely related substance.

I repeated the experiments of Cannon and Bayliss using deeply anesthetized dogs instead of cats. It was observed that the swelling which followed the injury was not limited to the area directly traumatized but extended into the loose tissues of the groin and flank. Hence it seemed that their amputations had not been performed at a sufficiently high level if the entire loss of blood and lymph into the injured part were to be determined. The method which I used was briefly as follows. A midline abdominal incision was made. The symphysis pubis was divided in the midline. The bladder and rectum were removed. The aorta and inferior vena cava were doubly ligated and divided. A posterior midline incision was made and the lower portion of the body was divided into two parts, the tail being discarded.

The difference in the weights of the traumatized and non traumatized extremities in these experiments showed that approximately one half of the total blood volume had been lost into the injured part, which was sufficient by itself to account for the decline in pressure. Similar results were obtained by Parsons and Phemister.

Many other experiments of a somewhat different nature were performed. One of these consisted of isolating the femoral artery in the groin, placing a tourniquet around the upper thigh constricting all structures save the artery and of traumatizing the thigh distal to the tourniquet. In these experiments there was no possibility for the absorption of toxic products from the injured part. Death occurred several hours following the traumatization and it was found that there was a loss of a sufficient part of the blood volume into the injured part to have caused it

In other experiments, the effects of milder trauma to an extremity, of trauma to the intestines and of burns were studied. Analysis of the fluid that escaped into or from the injured area in these experiments was carried out by Di Beard and others. It is to be noted in the experiments in which the intestines were traumatized that the fluid escaping into the peritoneal cavity had approximately the same composition in protein as the blood plasma. This was true of other constituents as well. The protein content is emphasized because it is protein which attracts fluid to the blood stream and holds it there, which is all important in maintaining the blood volume.

I shall consider in detail only the experiments in which burns were produced. These studies were performed on animals profoundly anesthetized with sodium barbital. The animals did not blister when burned but the skin became leather-like and fluid accumulated in the subcutaneous tissues. As has been stated, this fluid is blood plasma. The amount of this fluid was determined as follows. Only one half of the body surface was burned. Following the death of the animals, which in our experiments occurred after an average interval of fifteen hours, the body was divided into two parts by anterior and posterior incisions. The internal organs and head were discarded, and the difference in the weights of the two parts was determined. The average difference in weight equalled 3.34 per cent of the total body weight, the burned side always being the heavier. A comparison with the results of other experiments in which death was produced by the removal of blood plasma, shows that the collection of blood plasma at the site of the burn was sufficient to account for the decline in blood volume and death. It is my belief that fatalities in the human which occur within thirty-six hours following burns are due to the loss in blood plasma and the accompanying increase in the concentration of the red blood cells. Deaths which occur a number of days later are probably due to other factors.

In association with Dr Johnson the effects on the cardiac output and blood pressure of hemorrhage, of muscle trauma, and of histamine administration were studied. Taking up first the effects of hemorrhage, it was observed that following the removal of blood equalling 27 cc per kilogram of body weight the output of the heart had diminished considerably whereas there was very little alteration in the blood pressure. Forty minutes following the traumatization of an extremity, it was noted that the output of the heart had declined greatly whereas there was very little alteration in the blood pressure. On the other hand following the administration of histamine the blood pressure declined first and the output of the heart subsequently. Burch and Harrison found that the injection of large amounts of novocain into the spinal canal produces alterations similar to those that are produced by the injection of histamine. I have recently found that primary shock and bilateral adrenalectomy also are accompanied by similar alterations. Trauma to the central nervous system is usually accompanied by a simultaneous decline in the cardiac output and blood pressure. The only point which I wish to emphasize here is that uncomplicated hemorrhage and trauma to an extremity are both associated with first, a decrease in the output of the heart followed later by a decline in the blood pressure, while the alterations appear in the reverse order as a result of the injection of histamine.

Results of a somewhat similar nature were found by Roome, Keith and Phemister in experiments in which a low blood pressure was produced by a variety of procedures which included, hemorrhage, trauma to an extremity, plasmapheresis, histamine administration, etc. After the pressure had been reduced to a low level, the quantity of blood that it was necessary to remove in order to cause death was determined. Following hemorrhage and trauma, it was found that the removal of a relatively small volume of blood resulted in death whereas it was necessary to remove larger quantities when the pressure had been caused to decline by histamine administration.

If the observations which I cited are correct, then one may ask why it is that the criteria of shock and hemorrhage are not identical. As an example of the belief that they are not identical, it is usually stated that shock is associated with an increase in the concentration of the red blood cells, with no response to the transfusion of blood and with capillary congestion and hemorrhage in the tissues. On the other hand, hemorrhage is said to be associated with a dilution of the red blood cells, with a favorable response to transfusion and with an anemic appearance of the tissues. Evidence will be presented which shows that some of these statements are erroneous.

Experiments were performed on dogs in which the blood pressure was gradually reduced to a low level by the slow withdrawal of blood from the femoral artery. No anesthesia was used in these experiments except for the injection of novocain at the sites where the cannulae were introduced. After having produced a sustained decline in the pressure to approximately 70 mm. of mercury, the animal was allowed to die without having further blood removed. The desired condition was to have the blood pressure remain at a low level as long as possible preceding death. Usually death occurred approximately an hour after a sustained reduction in the pressure had been obtained. Capillary congestion and hemorrhage were noted in some of the organs at autopsy. An increase in the concentration of the red blood cells occurred in a few experiments.

A low blood pressure of longer duration was produced in other experiments. The pressure was reduced by the removal of blood from the femoral artery and death was delayed by the introduction of blood by the direct method from a suitable donor. If the blood pressure rose above 70 mm. of mercury further blood was removed. If death seemed imminent, a small quantity of blood was withdrawn from the donor and injected intravenously. In this manner, the blood pressure was maintained at a low level for several hours before death occurred. No evidence that the blood was incompatible was observed. The blood pressure records in these experiments were quite similar to those

that were obtained when an extremity was traumatized. All of the animals died despite the fact that more blood was introduced than was removed. In other words, after the blood pressure remained at a low point for several hours, transfusion was without benefit. An increase in the concentration of the red blood cells was found in all experiments. Capillary congestion and hemorrhage and necrosis were present in many of the tissues of the body. Particularly striking was the presence of free blood in the lumen of the intestinal tract.

Thus it is to be noted that an increase in the concentration of the blood, a negative response to transfusion, and marked alterations in the tissues in the body can be produced by hemorrhage and that they are not peculiar to traumatic shock.

In the care of patients, one rarely encounters as a result of hemorrhage a low blood pressure that persists for several hours. If bleeding from a large blood vessel takes place, usually either early death occurs or the loss of blood is stopped and recovery follows. If the bleeding results in almost immediate death, an anemic appearance of the tissues is found at autopsy. If the bleeding is controlled, usually the remaining volume of blood is augmented by the passage of fluids from the tissue spaces into the blood stream or fluid is added artificially, and a rise in the blood pressure and a decrease in the concentration of the blood occur. A somewhat different set of conditions is encountered when fluid is lost from many small vessels into an injured part. The speed with which fluid leaves the blood vessels is usually slower because of the small size of the vessels and because of the pressure in the tissue spaces. As the pressure in the blood vessels diminishes and the pressure in the tissue spaces increases, the loss of fluid locally is still further retarded. The fluid that is lost has a larger proportion of plasma and a smaller proportion of red blood cells than that existing in the blood stream. This accounts partially for the increase in the concentration of the blood. Since the blood pressure usually remains at a low point for a considerable time preceding death

following trauma to large masses of muscle, the tissues of the body are partially deprived of blood and oxygen and alterations such as capillary congestion and dilatation and hemorrhage take place

These observations explain why the treatment of severe shock is so unsatisfactory. After damage has resulted from an inadequate supply of blood to the tissues for a considerable time, regardless of the cause, fluids introduced into the blood stream will escape. As apparent exceptions to this statement, one observes occasionally the recovery of patients in whom the blood pressure has remained at a low level for a long time.

There may be various contributory factors which are partially responsible for the production and maintenance of shock. Food and water deprivation and exposure to cold increase the ease with which it can be produced. Prolonged anesthesia may greatly exaggerate the condition. I have observed recently that profound anesthetization with ether for six hours results in capillary hemorrhage and congestion in many of the organs of the experimental animal. Just as a serious illness reduces one's ability to withstand the loss of blood, similarly it lessens the amount of trauma that can be tolerated.

I would like to make several additional remarks concerning the treatment of shock. Drugs which constrict arterioles raise the blood pressure but do not increase the blood volume and that is what one wishes to accomplish. Vasoconstrictor drugs are of little value except in shock accompanied by vasodilatation. If one is to increase the blood volume, fluids must be introduced.

As regards the choice of fluid, the following study is of interest. In this experiment, a large quantity of salt solution was introduced intravenously while the intestines were being traumatized. It is to be noted that not only did most of the salt solution escape but that it carried a great deal of protein with it, thus diminishing the protein content of the blood plasma and decreasing the osmotic pressure. Blood is much the better fluid to inject for even though a large part of it escapes through the injured

capillaries, that remaining in the blood stream maintains a normal protein content as protein is present in the blood that is introduced. Andrus and Heuer have obtained encouraging results with the use of extracts of the adrenal cortex.

We have attempted a classification of acute circulatory failure from a physiological viewpoint. The modern tendency in surgery is to classify all forms of acute circulatory failure complicating operations and wounds, except organic heart failure, under the head of shock. The terms that have been used to designate the different types are

Hematogenic Type First to be considered is the hematogenic type. The initial and the most important circulatory change is the diminution in the blood volume. It is with the hematogenic type of shock that this paper is largely concerned. Shock as a result of uncomplicated hemorrhage is the simplest example. Shock following trauma to large masses of muscle belongs to this group, if my experiments and those of Parsons and Phemister have been interpreted correctly.

Neurogenic Type This term is used to designate the condition that is usually known as primary shock or collapse. It is more rapid in onset than the hematogenic type. The primary alteration is vasodilatation dependent on diminished constrictor tone as a result of influences acting through the nervous system.

Vasogenic Type Vascular dilatation may be brought about by agencies which act directly on the vessels. Histamine probably exerts the major portion of its effect in this manner.

Cardiogenic Type Acute circulatory failure as a result of primary disturbance of the heart occurs rarely. It is characterized by venous distention in contrast to the collapsed condition of veins that is found in peripheral circulatory failure. A rapid accumulation of fluid in the pericardial cavity produces this type of alteration.

A number of workers have repeated our experiments on severe trauma using similar anesthetics and have obtained similar findings. However, O'Shaughnessy and Slome using lighter anesthesia claim that it is necessary to invoke a nervous factor. They think that the loss of fluid at the site of injury is the most important factor but that it is necessary to add the neurogenic forces. Although another group in England has failed to confirm their results, I believe they contain important findings and cannot be dismissed lightly.

Freeman of this country considers vasoconstriction as probably the most important of the initiating factors in the production of shock. Even if it is an auxiliary subsequently, vasoconstriction delays the decline in blood pressure and the development of shock following hemorrhage by diminishing the calibre of the blood vessels. Swingle and his associates have reported that deficiency of adrenal cortex hormone results in increased permeability of capillaries and loss of plasma with blood concentration and serious reduction in circulating blood volume. They assume that this plays a role in surgical shock but proof of this view is lacking.

I would like to make several additional remarks concerning the first type, namely hematogenic shock. The initial and the most important circulatory change is the diminution in the blood volume. Unless the initial decrease in blood volume is too great, compensatory vasoconstriction maintains the arterial blood pressure at or near the normal level. The decline in blood volume is followed by a decrease in the return of blood to the heart and hence in a decrease in the cardiac output. If the volume of circulating blood continues to diminish, the blood pressure declines even though vasoconstriction is maintained. If the blood pressure remains depressed for a considerable time, the vasoconstrictor mechanism fails and vasodilatation results. When this stage has been reached, many other factors enter into the picture and make the condition worse. Most of these factors are probably common to all types of severe

shock regardless of the mechanism of the production. These include an insufficient supply of oxygen to the tissues with resulting damage, a decrease in the production of heat, an increase in the viscosity of the blood, an increase in capillary permeability, a diminution in the alkali reserve and probably the accumulation of toxic products. I think we can say with safety that histamine is not the cause in most instances. Muscle has a very low content of depressor substances. The amount of these substances necessary to produce shock could be obtained only by careful extraction from a mass of muscle greater than the entire weight of the animal (Slome). Recently, Sir Henry Dale made the following statement, "With regard to a possible role of histamine, we know now, what we did not know then, that of all the major tissues of the body, the muscles contain least of that substance. Whatever else it may have been, the shock following the Bayliss Cannon limb trauma was not histamine poisoning."

As regards the second type, neurogenic shock, it is seen typically in the fainting which accompanies emotional distress or minor injuries. A similar collapse may occur when the upper abdomen is opened and explored or in association with operations on the brain. The shock is explained by sudden inhibition of vasoconstrictor tone of central origin. The blood pressure may remain at a low level for an hour or more and then may rise spontaneously or following the giving of a vasoconstrictor drug with no subsequent ill effect. A similar fall of pressure in hematogenic shock would be a matter of grave concern. Neurogenic shock is associated with a reduction in blood pressure, with little or no decline in the blood volume and an adequate flow of blood to the vital centers is maintained for a much longer time than in the hematogenic type.

There are many instances of shock which are not so simple and which cannot be placed in any single one of these four types but are rather combinations of several of them. An example of this is the shock which follows the perforation of peptic ulcers. We have simulated this con-

dition experimentally by collecting and introducing into the peritoneal cavities of other dogs the various juices which empty into the stomach and duodenum. All of the animals became quite ill immediately following the introduction of one or more of the upper intestinal juices. The condition then seemed to improve for a while and became worse later as is frequently observed in the human following the perforation of a peptic ulcer. The most severe reactions were observed following the introduction of bile or pancreatic juice and the combination of the two exerted more ill effects than an equal volume of either of them alone. It seems possible that the pancreatic juice is actuated by the bile, thus increasing the total of the effects. The changes in the cardiac output and blood pressure produced by the introduction of the juices were studied. Although the results were not identical in all instances, it can be stated that the major primary alteration was a decline in the blood pressure, as is found in primary shock, and the subsequent change consisted of a greater drop in the cardiac output than in the blood pressure, as is found in secondary shock.

The initial signs and symptoms that were observed following the intraperitoneal injections appear too early to be explained by the absorption of toxic material. It seems likely that the most important of the early actions of the juices is that of a chemical irritant. This results in a dilatation of many small intraperitoneal vessels and I believe that it is brought about mainly by direct action on the vessels rather than through nerves, although both methods are probably concerned. At any rate, an early decline in the blood pressure is usually observed. After the blood volume decreases as a result of the marked increase in the circulatory bed and the passage of fluid into the peritoneal cavity, the output of the heart diminishes. The blood pressure is probably prevented temporarily from declining further by vasoconstriction elsewhere.

I wish to emphasize again the fact that the mechanism of the production of all instances of shock is not the same, and they cannot all be satisfactorily explained by one

theory Dr Ewing recently said, "There is no one cause of cancer", and I think the same statement may be made with safety in regard to shock That which develops following trauma to an extremity is a simple example in that the decline in blood volume is due certainly in the main to the loss of blood and plasma at the site of injury It has been shown that the condition which develops following the perforation of peptic ulcers is not as simple to explain Many different agencies may enter into the production of shock that is associated with operations Among these may be included, hemorrhage, sweating, the anesthetic, loss of plasma from exposed surfaces, the pooling of blood in vessels that are dilated as a result of mechanical irritation or nervous reflexes, infection and the diseases for which the operation is performed

In conclusion, the term shock should be used to designate a clinical syndrome that is familiar to all The pallor, apathy, sweating, cold skin, vomiting and weak pulse form part of the fully developed picture The work of recent years has shown that it is dependent on an inadequate supply of blood to the tissues, which may be brought about by the most diverse causes

DEATHS OF FELLOWS OF THE ACADEMY

ROBINSON, MEYER R, M D, 1125 Madison Avenue, New York City, graduated in medicine from the College of Physicians and Surgeons in 1900, elected a Fellow of the Academy January 6, 1910, died November 2, 1936

Dr Robinson was gynecologist to the Beth Israel Hospital and chief gynecologist and obstetrician to the Beth Moses Hospital He was a Fellow of the American College of Surgeons, the American Medical Association and held a certificate of the American Board of Obstetrics and Gynecology He was also a member of the County and State Medical Societies

RUSHMORE, EDWARD CARY, B S, M D, Tuxedo Park, New York, received the degree of Bachelor of Science from Swarthmore College of Pennsylvania in 1881 and graduated in medicine from the College of Physicians and Surgeons in 1886, elected a Fellow of the Academy June 1, 1896, died November 2, 1936 Dr Rushmore had been medical director of the Memorial Hospital He was a Fellow of the American Medical Association and a member of the County and State Medical Societies

COMMITTEE ON MEDICAL EDUCATION

REPORT ON THE NINTH ANNUAL GRADUATE FORTNIGHT

October 19 to 31, 1936

In January the Committee on Medical Education chose "Trauma, Occupational Diseases and Hazards" as the general subject for the Ninth Annual Graduate Fortnight. A Subcommittee, composed of Dr John J Moorhead, Chairman, and Drs Walter P Anderton, Frederic W Bancroft, Harlow Brooks, Emanuel Libman, William F MacFee and Harrison S Maitland, was appointed to prepare the general plan and direct its carrying out. The dates were set as October 19 to 31. A registration fee of \$3.00 was decided upon.

It was decided to present the same features as in previous years, that is, evening meetings to be held at the Academy, afternoon clinics to be held in selected hospitals (twenty-two being invited to participate), and an exhibit, and in addition, to arrange special demonstrations or moving pictures to follow each of the evening meetings at the Academy. A Committee on Clinics was appointed with Dr Charles F Tenney as Chairman, Dr Tenney having been appointed a member of the Subcommittee to replace Dr Harlow Brooks, deceased. The Clinic Committee was made up of representatives appointed from each hospital which participated in the Fortnight, and met several times with the Subcommittee to plan and coordinate the clinical programs. Dr Maitland was chosen Director of the Exhibit and a Committee was appointed to assist him.

Two to four speakers were selected for each evening and were asked to limit their talks in order that the meetings might be concluded by ten o'clock. No arrangements were made for publication of papers presented at the evening meetings, but speakers were informed that the Academy reserved the rights to publish papers presented at these meetings in one of its journals or in the form of a volume,—release of papers to the authors to be given in case publication by the Academy was not undertaken.

Publicity In May, an announcement in the form of a reading notice was sent to a group of important medical journals, medical libraries and medical societies, requesting that some publicity be given to the event. As a result, a number of reading notices appeared throughout the country.

In June, a preliminary announcement, with return post card attached, giving a comprehensive outline of the Fort night was mailed to over twenty thousand registered physicians living within a radius of one hundred miles of New York City. The complete program was printed in July and mailing was begun in August 4, 176 requests were received for copies of the complete program.

Registration and Ticket Distribution A total of three hundred and forty-four physicians registered for the Fort night. These registrants came from sixteen states, four from Canada and one from the Republic of Panama. Some what under half came from New York City. Fellows and Members of the Academy were issued tickets without charge.

Attendance at Evening Meetings averaged three hundred and forty-six. The smallest attendance was two hundred and eleven and the largest five hundred and forty eight.

Afternoon Clinics had an average attendance of fifty to sixty.

The Exhibit had an average attendance of three hundred and seventy-five to four hundred. It included one hundred and twenty-five exhibits presented by one hundred and sixty-four exhibitors. The exhibits were presented in five large exhibition rooms of the Academy building, besides halls and adjoining anterooms and included 1589 x rays, 1672 photographs, 220 pathological specimens, 560 charts and drawings and approximately 400 models, equipment, apparatus and instruments. No tickets of admission were required to visit the exhibit.

The following is a tabulation of the registrations

REGISTRATION—TOTAL 344

From New York State 262

Manhattan	140	Bronx	37
Brooklyn	33	Queens	14
Westchester	5	Richmond	4

Up State New York 29

From New Jersey 41

From 15 other States and Countries 41

Connecticut	7	Ohio	5
District of Columbia	2	Pennsylvania	7
Illinois	1	Virginia	1
Indiana	2	West Virginia	2
Louisiana	2	Wisconsin	1
Maine	1	Utah	1
Massachusetts	2		
Michigan	1	Canada	4
Minnesota	1	Republic of Panama	1

JOHN J MOORHEAD, *Chairman*

WALTER P ANDERTON

FREDERIC W BANCROFT

EMANUEL LIBMAN

WILLIAM F MACFEE

HARRISON S MARTLAND

CHARLES F TENNEY

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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

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NINTH ANNUAL GRADUATE FORTNIGHT "Trauma; Occupational Diseases and Hazards" October 19 to 31, 1936

RELATION OF TRAUMA TO PULMONARY DISEASE*

J BURNS AMBERSON, JR

Interpretation of the term, trauma, meaning originally injury caused by external violence, has been progressively broadened to include a great variety of injuries of structure and function caused by a great number of agents. The need for a clearer conception of the relationships has increased in proportion. The soundest basis for this is a broad understanding of the fundamental mechanisms which usually operate in the disease under consideration. Without this a reasonable estimate of the bearing of trauma is impossible. It is my purpose, therefore, mainly to discuss some of these mechanisms in pulmonary disease.

First, it is necessary to bear in mind the physiological mechanisms which guard the lungs against the invasion of foreign agents and dispose of those which get past the portal. The most important are the pharyngeal and laryngeal reflexes which, when effective, divert substances from the glottis, and together with the tracheal reflexes, initiate coughing for the expulsion of substances from the lower respiratory passages. Impalpable materials, such as dust and bacteria, are removed by the finer mechanisms of ciliary action of the bronchial mucous membranes and by phagocytosis.

* Delivered October 23, 1936

Another function which also has a protective value is a complicated one in which respiration and circulation operate to maintain a correct moisture of the pulmonary surfaces. These defences normally act as a harmonious whole. Then smooth and efficient play depends on intact nervous pathways, a healthy state of the tissues of the respiratory tract, normal tone of muscles of the chest and abdominal walls and diaphragm, and on good circulation, all of which, of course, means good general health. They are safeguards which do not yield readily even under the conditions of poor health.

In unusual situations, the failure of one protective mechanism may directly or remotely involve the failure of another, and it may be the combination which causes harm. Thus, the entrance of a foreign substance into the bronchi is not necessarily injurious unless it becomes lodged, and lodgment is due to ineffectiveness or failure of the coughing mechanism. Under other unusual conditions, perfectly intact defenses may fail, such as happens when a blow to the mouth dislodges a tooth and casts it through the larynx into a lower lobe bronchus,—unknown to the victim who thinks he swallowed the missing member. Protective reflexes may be impaired during states of unconsciousness, and this varies from slight dulling during sleep to almost complete abolition during deep coma from bodily injury, alcoholism or other cause. Material from the nasopharynx and mouth may then gain ready access to the smaller divisions of the bronchial tree and there find lodgment. The consequences depend on the physical character and toxic qualities of the substances aspirated and retained. Fluids which are not heavily contaminated with virulent bacteria may set up only temporary irritation or mild broncho pneumonia. If the fluid carries with it necrotic matter bearing anaerobic pyogenic bacteria from pyorrhea pockets or tonsillar crypts, acute suppurative pneumonia or lung abscess may follow. Inhalation and retention in the bronchi of vomitus during unconsciousness sometimes

causes rapid death of tissue or acute gangrene of the lung ending fatally in one to two weeks. Foamed substances or foreign bodies lodging in the bronchi may at first be only mildly irritating, giving rise to the slight cough, wheezing, and slight difficulty in breathing which we associate with bronchial stenosis and catarrhal inflammation. Occasionally, incomplete or complete occlusion of a bronchus occurs abruptly with resulting obstructive emphysema or atelectasis. Regardless of the first effect, these occluding and irritating substances, if they remain, set up mild or severe infection beyond the point of lodgment, and this sooner or later leads to destructive, suppurating and organizing bronchopneumonia and bronchiectasis. The section of lung involved may be small or all inclusive, depending on the seat of the foreign body in a small branch or a main stem bronchus.

In many instances, the start of one or more of these pulmonary processes within ten days or two weeks after trauma may be reasonably attributed to the trauma on the basis of these mechanisms. Actual examples in our experience include bronchopneumonia following unconsciousness caused by automobile injuries, suppurative pneumonia ending fatally six months after a compound fracture of the jaw, bronchopneumonia from the aspiration of contaminated fluid during the careless irrigation of the paranasal sinuses, lung abscess developing in a man shortly after he fell into the East River near the mouth of a sewer, and others.

These conditions often are related to the stasis of fluid secretions in the bronchi and lungs. Normally, the fluid interchange here is great, and excessive amounts are disposed of through absorption into the circulation, expulsion by coughing, and by evaporation. A serious failure of any of these mechanisms and the resulting accumulation of fluid may create a favorable medium for infection. A familiar example is hypostatic pneumonia in the patient with failing circulation. Likewise, failure of the extrinsic respiratory muscles and particularly of the diaphragm to function properly not only may cause impairment of ventilation of

the lung but also may interfere with disposal of fluid from it. The accumulation may then favor infection with organisms carried in with inspired air or in material aspirated from the pharynx. Trauma of the chest wall or upper abdomen may be the cause of inaction of this important respiratory mechanism. Usually the effect is only partial, temporary, and harmless, but, when the injury is severe and associated with shock, factors may combine to set up a train of disturbances leading to pneumonia.

Blood entering the bronchi and lungs behaves like any other fluid except for its power to coagulate. A clot may act like other foreign substances and, by occluding the bronchus, lead to obstructive emphysema or partial deflation of the lung. Retention of large clots, however, does not often occur. Fluid blood, retained in the alveoli, is irritating and so favors congestion and inflammation which usually is mild and fleeting. I have observed bronchopneumonia of a few days duration in an epileptic who, during a convulsion, bit his tongue and aspirated the issuing blood.

That bleeding from preexisting lesions in the lungs may lead to aggravation of the disease is well recognized. Rupture of a varicose vessel in a bronchiectasis may lead to hemoptysis. Except for the temporary break in the vessel, the incident may be quite harmless. If some of the blood accumulates and is retained in the alveoli, a mild and passing inflammation results, but if the blood washes out of the bronchiectatic sac some anaerobic bacteria and these are also retained, then the resulting pneumonia may be suppurative, leading eventually to more extensive bronchiectasis. Much the same is true of hemoptysis in pulmonary tuberculosis. If the bleeding arises from the vicinity of a healed and fibrotic section which is not casting off tubercle bacilli at the same time, the results are not likely to be very harmful. But this is relatively seldom. Hemorrhage in these cases usually arises from the rupture of a blood vessel in the wall of a cavity which is in direct connection with the bronchi and which is also discharging pus laden with tubercle bacilli. Exsanguination is infrequent. The grave danger is aspiration and retention of

blood in healthy parts of the lungs. Here is a very fluid medium becoming well charged with tubercle bacilli as it escapes. The flow stimulates stronger respiration and coughing, effective protection in some cases, but in others inadequate. A rapid stream overwhelms the physiological defenses and with each inspiration ebbs into the bronchi of the dependent parts. That which is retained in the alveoli initiates not only the usual posthemorrhagic aspiration bronchopneumonia but also an associated spread of tuberculosis which then runs the course of any fresh lesion of that nature.

I shall dwell further on the subject of tuberculosis because it is alleged to be aggravated by trauma more often than any other pulmonary disease. Knowing, as we do, that the course of tuberculosis is subject to many deviations, it often becomes an exacting task to distinguish the developments which are due to trauma from those which merely follow it. In some instances, the question is a matter of judgment which varies with the experience and conceptions of the clinician, but in a majority of cases it is possible to obtain objective evidence which is of definite and decisive value. The minimum requirements in examination are a thorough and accurate history, complete physical examination, a technically satisfactory roentgenogram of the chest, and careful examination of the sputum by one of the more refined and reliable methods for the detection of tubercle bacilli. It may be necessary to observe the patient under known clinical conditions for a time to secure complete data. If previous medical records, and, especially, previous roentgenograms of the chest are available for comparison the problem is greatly simplified. With the information from these studies, one must then decide whether the mechanisms in progress were influenced by the trauma. For illustration we may return to the problem of pulmonary hemorrhage in a tuberculous case. Most hemorrhages come during the natural course of the disease and start while the patient is quietly at rest. Nevertheless it is fair to conclude that some may be initiated by trauma, such as those which immediately follow a heavy blow on

the chest or a violent physical strain. An example is the case of a tuberculous workman who, in the course of his occupation, lifted a heavy box, felt a tearing sensation in his chest and immediately coughed up blood. After the cessation of bleeding in such cases, the question is to what extent the preexisting tuberculosis was aggravated. The mere break of a vessel usually heals itself within several weeks after the thrombus forms, and the mere loss of blood, therefore, does not indicate a serious aggravation. A short run of fever after the hemorrhage may represent only a simple bronchopneumonia which likewise resolves satisfactorily. Serious aggravation should show itself in a few days after the hemoptysis—usually by fever, the detection of rales at the base of one or both lungs and the finding by X-ray of the shadows of fresh bronchopneumonia which after a week or two fails to resolve or actually progresses, at the same time tubercle bacilli will usually be found in the sputum. It must be remembered that the usual cause of spread of tuberculosis in the lung is the aspiration into healthy parts of purulent exudate from cavities. A spread demonstrated for the first time two or three months after a hemorrhage is not likely, therefore, to be due to the hemorrhage. The necessity of giving due consideration to time relationships is most important.

Pulmonary tuberculosis may be stimulated detrimentally by a variety of nonspecific agents such as the injection of arsenical drugs or of vaccines, exposure to the X-ray, excessive sunburn, or severe intercurrent respiratory infections. Latent and fibrous lesions are not easily influenced, but fresh inflammatory lesions which are progressive or on the verge of progression may occasionally be aggravated.

Many occurrences, like those cited, are simple to explain on the basis of the objective findings. A more difficult situation is that, for instance, in which, following an injury, a person reports pain in the chest, fatigue and loss of weight which he ascribes to his tuberculosis. The point at issue is whether this obviously old but newly discovered disease was aggravated by the trauma. Objectively, there may be no evidence that can lead reasonably to the presumption of renewed activity or progression of the lesions.

The mental anguish of learning the diagnosis may be more of a factor in the genesis of the symptoms than anything else. It recalls Claude Bernard's definition of a healthy man as one who is unaware of his disease. We cannot escape the duty of recognizing and fairly estimating psychogenic factors in physical symptoms, though the opportunity of abusing the duty is open here. In clinical medicine it is not possible always to invoke the explanation of clear cut principles to explain a series of events, but, the goal should always be to search out and identify underlying mechanisms if possible.

This is equally true of such accidents as rupture of the lung with the production of pneumothorax. It is doubtful if a perfectly normal lung ever ruptures, except by a puncture wound from without. Aside from such wounds, caused by stabbing, the fracture of a rib, and the like, the common causes of rupture of the pleura are the ulceration of a subpleural tubercle, the breaking of a subpleural emphysematous bleb or the tearing of a pleural adhesion. If trauma, such as a sudden violent strain, precipitates the break of the pleura at a point where it is damaged by one of these lesions, it may in unusual cases be responsible for sudden pneumothorax, collapse and death. Immediate fatalities are not frequent, however. A simple mechanical tear usually heals itself rather rapidly, and the disability is not lengthy. An accompanying hemorrhage into the pleural space is more serious, and the opening of a tuberculous cavity into the pleura with the inevitable complication of empyema is most serious. "Spontaneous" pneumothorax is much more frequent than indirect traumatic pneumothorax. Evidence should be clear, therefore, to indicate the close time relationship between the trauma and the onset of symptoms.

Tuberculous pleurisy, induced by trauma which is severe enough to fracture ribs also, is obviously due to the activation of a preexisting focus in the pleura or lung. Such cases are very uncommon and, when they occur, run the usual course of pleurisy with or without effusion.

The late effects of empyema or hemothorax, which may have been related to severe trauma, such as a gunshot

wound, occasionally show themselves as fibrous and calcific organization of the pleura, shrinkage of the affected hemithorax and lung, and a degree of fibrosis and emphysema of the lung

Silicosis is a subject in itself and it must suffice here to mention that it represents the results of long and often repeated injury of the pulmonary tissues by the physical and chemical action of inhaled dusts, and that this injury frequently opens the way for the development and progression of tuberculosis. On the other hand, there is no reason to believe that pulmonary tuberculosis is often influenced by the inhalation of irritating gases or fumes. The experience of the World War provided abundant evidence on this point and spoke eloquently for the efficiency of the physiological defenses and reparative forces of our respiratory systems. The usual effect of the inhalation of such gas is inflammatory edema of the bronchi and lungs which soon clears away. More serious or permanent effects usually depend on more intense initial inflammation and the entrance of infection causing bronchopneumonia. If prolonged, this may suppurate or undergo organization with the gradual development of disabling fibrosis and emphysema.

It is not possible or desirable to enumerate all the imaginable varieties of trauma which occasionally incite or aggravate pulmonary disease. It is more profitable to study fundamental mechanisms of morbid processes in order that the relationships of trauma may be fairly estimated. Consider also that under ordinary conditions of life the lungs are not very vulnerable.



MEDICO LEGAL ASPECTS OF INDUSTRIAL POISONINGS*

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When I venture to speak on the medico legal aspects of industrial diseases, it is with the full consciousness that so far as the legal aspect goes, I am abysmally ignorant and, I fear, what the Catholics call invincibly ignorant, for I never can hope to understand the legal mind nor to see eye to eye with lawyers on what constitutes evidence or how that elusive element, the truth, is to be sought after. All I shall try to do this evening is to take up a few of the more important industrial poisons and point out the difficulties we encounter when we try to establish a claim before a State Industrial Accident Board or to dispute such a claim. I will choose for the purpose the oldest and most familiar of the poisons, lead, benzene or benzol, with its homologues toluol and xylol, carbon tetrachloride and trichlorethylene, and the mixture of solvents and diluents which go to make up so called Ducos and lacquers.

When you take a compensation case, as we call them, you find that your attitude to it must be different in some ways from that which you are accustomed to hold toward your cases. It is not enough to convince yourself that the man has lead poisoning and must be removed from further exposure and given appropriate treatment, you must be prepared to furnish proof, for you are now touching people's pocketbooks, you are deciding that the insurance company must bear the expense of the illness and pay compensation, and you must meet the opposition of the insurance lawyers.

It is easy to say to an overworked business man that he has premature cardiovascular-renal disease and that his way of life is responsible therefor, but suppose his case came up before a compensation board. The lawyers for the insurance company would demand proof. "Is it not a fact, doctor, that general arteriosclerosis sometimes develops in young men who have never been subjected to

* Delivered October 28, 1936

unusual pressure or strain? What proof have you that in this case it was worry and overstrain that caused it?" Well of course you could not prove it and the claimant would lose his case as many working men lose theirs because our medical knowledge is not yet systematized sufficiently to pass the legal test. Or perhaps you will be defending a claim based on death from hemorrhage and aplastic anemia in a benzol worker and the lawyer will produce text-book authorities on idiopathic blood disease. Or it may be a death from acute bronchopneumonia in a man who breathed nitrous fumes and the lawyer will have statistics on the incidence of pneumonia in the laboring class in general. I usually meet such objections by saying that there is such a thing as so called spontaneous fracture of the bone but that we do not bother to consider it when the injured man is known to have fallen from a scaffolding.

Let us take lead first, a poison familiar to all, but none the less presenting difficulties from time to time. To begin with, it is not clear to all physicians that lead absorption does not entitle a worker to compensation. There must be proof also, of intoxication, of damage done by the lead. To establish a case one must first prove exposure to lead, by the history of the man's occupation then absorption and then poisoning. Obviously the occupation is important, for the form of poisoning that develops depends on the quantity that is absorbed and the rapidity of absorption. Exposure having been established the proof of absorption is sought in the presence of the lead line on the margin of the gums, changes in the red blood cells and the presence of lead in excreta. The lead line is an excellent positive finding but its absence is of no real significance. It is rare among American workmen nowadays and it always was rare among the better class. Dr. May Mayers of your State Department of Labor examined in 1929, 381 lead workers and found that 201 had evidence of lead absorption but no lead line.

The examination of the blood is much more valuable, in fact every working man now knows about stippled cells. It is true that such cells are found in other conditions and

that the authorities are not at one on the number which is to be regarded as significant but if the stippling of the red blood cells is taken together with the whole blood picture the diagnostic value cannot be denied. In other forms of anemia these cells are found in large numbers only if there is a low cell count and low hemoglobin content but it is characteristic of lead poisoning that the number of stippled cells is quite out of proportion to the anemia. In lead poisoning we do not expect to have a count much under 4,000,000 nor a hemoglobin much under 75 per cent but with this fairly normal lead picture there will be a large number of stippled cells.

Badham¹, of Australia, who has done much work on lead poisoning among the lead miners of Broken Hill, where, as in our western mines, the ores are near the surface and contain the fairly soluble carbonates and sulphates, depends largely on blood examination for the diagnosis. Punctate basophilia of the red cells, in the absence of signs of primary anemia or in the absence of a good cause for secondary anemia, is proof sufficient of lead intake. He even accepts the lead as cause in cases where the above are present, but the number of basophiles is very large. Polychromasia is generally present, nucleated reds only occasionally, normoblasts are rare. Large numbers of stippled cells usually mean a rapid intake of lead, as when the man works in a very dusty atmosphere.

Carey McCord² urges the search for what he calls basophilic aggregations in the red cells, for he says that these appear far earlier and in larger numbers than the typical stippled cells. The basophilic substance is clumped if the blood is laked and appears in easily visible masses. Normal adults have about one per cent of such red corpuscles, those exposed to lead, about one and a half per cent, and if there are as many as two or more per cent, lead absorption, not lead poisoning, is indicated. McCord is in charge of the medical work of the Chrysler and Plymouth car factories in Detroit and he told me recently that he depended on this blood examination for the detection of early plumbism.

R R Jones³ advises looking for abnormally large numbers of reticulocytes

The third proof of absorption is the excretion of lead in urine and feces. Unfortunately, the recent investigations have shown that adults who are not exposed to lead either in their occupation or through drinking water may excrete definite quantities in both stool and urine so that it is no longer enough to establish lead excretion, it is necessary now to show that it exceeds the normal. Badham says that the average excretion of lead in the inhabitants of Sydney is 0.02 mg per liter of urine. This figure is about the same as that of Weyrauch and Litzner⁴ for Germans, and a little lower than that of Fretwurst and Hertz⁵ for inhabitants of Hamburg. City dwellers have an amount somewhat higher than country dwellers. Thus Francis⁶ found London people excreting an average of 0.049 mg, while those in rural regions averaged only 0.023. The figures given by Kehoe and Thamann⁷ run higher than most. They found an average lead excretion in 135 medical students in Cincinnati of 0.04 mg per liter of urine and 0.24 mg in a 24 hour stool. Aub considers the examination of the feces as more valuable than that of the urine but Badham holds the reverse is true.

In cases of lead poisoning, Badham expects to find an amount in the urine running from 0.1 mg to 0.3 or even to 1.0 if the intake is large. But sometimes especially if there is severe anemia, the amount may not exceed the normal.

Suppose you have proved exposure and absorption. That is not enough for an industrial compensation board, you must prove that the man is ill and that he is suffering from lead poisoning. He may not present a clear cut picture at all and your diagnosis may have to be based on a combination of objective signs and subjective symptoms, no one of which is conclusive alone but together they make up a convincing picture. It is impossible to go into detail on this subject, but I would call your attention to the scheme worked out by the Public Health Service (Bulletin

116), which has also been followed by the New York State Department of Labor in an examination of 481 lead workers

There are two points of controversy with regard to lead poisoning, first the relation of chronic plumbism to lesions of the blood vessels and the kidneys and second, the relation of the gastro intestinal form to intestinal ulcer. With regard to the first, no doubt existed in the minds of the older pathologists who dealt with abundant material from human sources. From the days of Bright and of Tanquerel des Planches, to the period represented by Strumpell, Robert, Oliver, Osler, it was an accepted fact that lead was responsible for sclerotic changes in the blood vessels and for the typical contracted kidney. The recent entry of the animal experimenter into this field has thrown doubt on the causative role played by lead for it is impossible to produce these changes in animals, but then it is impossible to reproduce the form of slow chronic poisoning that occurs in industry.

It seems to me a mistake to reject the conclusions of men who saw more cases of chronic plumbism than any one man could possibly see in a life time under modern conditions. In England the experts for the Home Office accept as occupational in origin the chronic nephritis and general arteriosclerosis of old potters. The Staffordshire potteries, thirty or forty years ago, were very dusty and dangerous and practically all men and women potters breathed lead dust throughout their working days. They contracted lead poisoning early in life and though now these English potteries are managed with a care and skill almost unequalled in any lead industry and though there are practically no new cases of poisoning, still these old potters are believed to be suffering from the effects of their early plumbism and when they die from renal or vascular disease compensation is paid to the family. However, even if one agrees with this attitude one would refuse to accept such a claim in the absence of a history of typical lead poisoning or if the exposure has lasted only a few years.

I might illustrate this by a case in which I was called as expert. A young man in the early twenties had worked

for nine months in a dangerous lead industry, making storage batteries, but monthly examination by the plant physician had not revealed lead absorption. Some months after quitting work he had the radical operation for hernia and died of hemorrhage within twenty-four hours. A claim was made for compensation on the ground that the hospital report showed large numbers of stippled cells in the blood and the autopsy report showed scattered areas of arterial thickening. The hemorrhage was assumed to have been caused, not by an accident at the time of the operation, but by the rupture of one of these thickened areas and the symptoms which ordinarily would have been interpreted as due to shock from internal hemorrhage were taken as evidence of lead encephalopathy. It seems hardly possible that expert medical witnesses would put such an interpretation on this history but several did and I believe the compensation was awarded.

There is an increasing body of evidence connecting repeated attacks of lead colic with the production of gastric or duodenal ulcer, and it is not difficult to see such a connection. However, this condition should never be accepted as caused by lead unless the history shows that the victim has suffered from repeated attacks of lead colic. Teleky has reported a case of fatal intestinal hemorrhage which occurred in the course of an attack of colic and the presence of an ulcer was established at autopsy. Here the lead was held responsible both for the ulcer and for the hemorrhage.

The list of fat solvents used in industry is very long and is continually receiving new additions. Unfortunately, our knowledge as to the effect of long continued exposure is very scanty in connection with many of them, although the acute effects may have been determined by tests on animals. Of course it is very difficult to study chronic poisoning through animal experiments.

I have selected a few of the most important members of this group of compounds which owe their value to two properties, the ability to dissolve fats and volatility, for a solvent to be useful must evaporate fairly quickly. The

solvents are used to dissolve natural gums, such as shellacs, resins, rubber, gutta percha, for the newer cellulose compounds, nitrate and acetate, used in making lacquers, dopes for fabrikoid, waterproofing, artificial leather, patent leather, for celluloid, nonshatterable glass, for fats, oils, greases, in degreasing machine parts and in dry cleaning, also as thinners for coatings and as removers of coatings

Benzol, benzene, is one of the best of these and would enjoy a far wider use were it not for the dangers attending it, dangers made known to the manufacturing world by the investigations of the National Safety Council. While benzol has been given up in many processes it is still used in sealing compounds for cans and bottles, in dope for patent and artificial leather, in floor stains and finishes, in rubber cements, in making drugs and chemicals and in mixtures for dry cleaning. Claims for compensation for benzol poisoning are not infrequent and they are sometimes hard to sustain because a rigid standard has been set up—far more rigid than for any non industrial blood disease—and unless the picture presented conforms to this in all details the case may be thrown out. To my mind this is all wrong. Benzol attacks the marrow of the long bones and the result is an aplastic marrow and a blood picture typical of the latter, erythrocytopenia, granulocytopenia, thrombopenia, and absence of all signs of regenerative activity. But surely it is conceivable that all elements of the marrow may not be simultaneously and equally injured and that this picture may vary in one or more details. It is also conceivable that at death the marrow may be only partially aplastic with areas of hyperplasia. I contend that the crucial factor in the case is the victim's occupation and that a blood disease occurring in a benzol worker should be considered of occupational origin, regardless of its exact character. As a matter of fact we have in the literature instances of various forms of leukemia and of regenerative anemias with hyperplastic marrow following exposure to benzol⁸. I think the time is not far distant when it will not be necessary to show a completely classical picture in order to prove damage from benzol. One feature of benzol poi-

soning which is very irritating to insurance lawyers is the way the damage progresses even after all exposure has ceased. This is now a well proved fact.

Toluol which is methyl benzol is a very important solvent because it can be substituted for benzol for many purposes and has been ever since the report of the National Safety Council was published. Xylol, dimethyl benzol, is less volatile and less useful. The Council's report included experiments by Batchelor⁹ showing that the severe blood changes characteristic of benzol poisoning do not occur when toluol or xylol is substituted. This statement has recently been called in question and we cannot now speak with the same positiveness as before. A group of English physicians¹⁰ have reported a case of typical aplastic anemia in a man who worked with toluol only and they claim to have produced in animals the same blood changes with toluol as with benzol. In my experience, however, claims for compensation on the part of men exposed to toluol have not been based on blood disease but on diseased conditions which we do not connect with these coal-tar products such for instance as acute glomerular nephritis, or contracted kidney, or pneumonia. In such cases the claim does not seem justified and yet as I look back on my evidence in these cases I feel far from sure that I was right. We know too little about the action of toluol on the organs. This is a field that should be worked over thoroughly, for toluol is at present widely used especially in spraying lacquers and large numbers of men are exposed to the fumes. The Germans use a mixture of toluol and xylol in lithography and of late they have reported many cases of rather ill defined disturbances from the fumes of one or both of these solvents, including slight leucopenia, affecting the granulocytes¹¹. In this connection one must remember that toluol and xylol are comparatively new in industry, that is, we have as yet no clear evidence of the effect of long continued exposure to them.

Carbon tetrachloride, a very widely used solvent, differs from chloroform only by one more atom of chlorine displacing an atom of hydrogen. It is one of a large group of chloro-

inated hydrocarbons, valuable in industry because they are not only volatile and good fat solvents but non-inflammable. Many attempts have been made to determine the relative toxicity of the members of this group but so far unsuccessfully. It seems that the unsaturated compounds, such as trichlorethylene, are less toxic than the saturated such as chloroform, which is trichloromethane, and carbon tetrachloride, which is tetrachloromethane. This last is a less powerful narcotic than is chloroform but it is far more likely to cause damage to liver and kidneys than is the latter. The work done on carbon tetrachloride for hookworm therapy has thrown much light on its danger as an agent in industry and there is no difficulty in establishing the toxic origin of liver or kidney disease which follows a prolonged exposure to carbon tetrachloride, or more often a single attack of severe acute poisoning. Nor is it hard to establish a claim for gradual loss of health—disturbed sleep by night, drowsiness by day, anorexia, constipation, loss of weight, so called nervousness—in men who inhale daily small quantities of this narcotic. More difficult to explain is an acute pulmonary congestion or a broncho pneumonia following exposure to these fumes. In former years I used to refuse to accept such a case as occupational but now I am inclined to believe it may be. For we know that carbon tetrachloride can decompose under the influence of heat into carbon monoxide, hydrochloric acid and phosgene. The presence of alkalis or magnesium or of iron hastens this change. So great an authority as K. B. Lehmann¹² of Wurzburg believes that such decomposition occurs in the body and is the explanation for much of the damage caused by this compound.

As for the production of changes in the eye, such as retinitis, we have as yet only a single published report¹³ of such a finding and it would be difficult on so slight evidence to establish a claim for loss of visual acuity or altered color sense.

Trichlorethylene is used for the same purposes as carbon tetrachloride and we usually tell manufacturers that it is the less dangerous of the two, for so far no cases have

come to light of injury to the organs such as carbon tetrachloride causes. It is, however, a stronger narcotic (Joachimoglu says it is thirteen times as strong) and may cause death if the unconscious victim is not removed from the fumes in time. A few cases of acute pulmonary inflammation have followed excessive exposure to fumes of trichlorethylene. In one of these, phosgene was assumed to have been formed through the decomposition of tri by a naked flame under a kettle, but, according to Lehmann and also VanThemschen¹⁴, trichlorethylene, like carbon tetrachloride, undergoes such decomposition within the body.

The claim has been made that trichlorethylene causes paralysis of the sensory fibers of the trigeminus, but it is now generally admitted that the reported cases were caused by some impurity in the solvent not by tri itself, for the pure substance has been used by addicts without any such effect, as was recently shown by Eichert¹⁵. Evidence as to optic nerve injury from trichlorethylene is accumulating, the Germans have reported several cases of more or less marked loss of vision, with retro-bulbar neuritis or with atrophy of the optic nerve. A recent article by Kunz and Isenschmid¹⁶ describes a case of greatly reduced visual acuity, unequal pupils, loss of light reflex, all following exposure for six months to the fumes produced by evaporating 100 to 300 c c of trichlorethylene each day.

Both tri and tetra may cause addiction in a worker and some of the severest cases described in German literature were in addicts. What the courts would decide in such a case I do not know, none has so far come to a hearing. My own opinion would be that the employer should be held responsible both for the addiction and for the resulting illness.

Perhaps the most numerous of the disputed cases that come up before compensation boards nowadays—insurance companies now for the most part settle clear cases without question—are presented on behalf of sprayers of lacquers or Ducos, especially in automobile manufacture. Now what basis is there for such claims? That they are made in good faith is unquestionable. A man has been working for months or perhaps years in an atmosphere more or less

heavily charged with fumes from the fine spray of the compressed-air atomizer, the spray gun. These fumes are disagreeable, with a sweetish, cloying, even nauseating odor. At the end of the day, especially when he is new to the work, he feels dopey, has headache and no appetite for his supper. Then when he develops an organic disease, and his doctor cannot tell him the cause, what is more natural than that he, and often his doctor too, should link it up with those ill smelling fumes, with long and fearsome sounding chemical names?

To deal justly and fairly with such a case is not easy. Of course the formula of the solvent mixture must first be secured, but sometimes one cannot escape a suspicion that the mixture has not always been the same. Manufacturers of coatings do at times vary their formulae, if for some reason a certain solvent has gone up in price and a cheaper substitute is available, but the buyer of the dope is not notified of the temporary change. That is something that cannot be proved in court and it is one of the features of industrial disease compensation which leave one with the uncomfortable feeling that complete justice may not have been done in connection with certain claims.

The typical formula for lacquers calls for alcohols, acetates (methyl, ethyl, butyl and amyl), toluol, xylol or one of the low boiling petroleum distillates, naphtha, petroleum ether. Of these the alcohols—methyl is not used—may be disregarded, for though the higher alcohols are toxic when drunk, they are not volatile enough to poison the air. About the acetates we know less. The Smiths¹⁷, father and son, of the University of Pennsylvania, find butyl acetate distinctly more toxic than the others which are supposedly fairly harmless. There remain toluol, xylol and petroleum ether and I do not think any of us can say positively what effect may be produced by these fat solvents, which have an affinity for the lipoids of the central nervous system, if they are breathed in day after day for years. It is possible that such small doses do no real damage, that the body is able to break down these compounds and get rid of them. Certainly they are not cumulative poisons as are

the metals, they do not remain in the body unchanged, but there is such a thing as an accumulation of effects. Our knowledge concerning them, and concerning the acetates, is based on animal experiments and it must not be forgotten that the actual conditions of industrial poisoning can not be reproduced in such experiments.

There is not time for more than this very inadequate treatment of my subject and as I warned you it has been mostly medical, very little legal. I should like to close with a fervent hope for a change in the method of administering the compensation laws. Unless you have yourself gone before a state commission you can have no idea how difficult it is to make yourself clear to a group of non-medical referees and lawyers. It is really absurd to expect laymen to pass on these questions, to decide for instance between a diagnosis of pernicious anemia and one of benzol poisoning, or between manganese poisoning and encephalitis. It is as if a committee of ordinary citizens were called on to decide whether a bridge was properly constructed. These questions are technical and should be entrusted to the technically trained. However, physicians are really to blame for the situation. Twenty-five years ago doctors in the employ of great companies worked, many of them, so wholeheartedly for their employers as to lose the confidence of the workers, pronouncing all fatal accidents as due to sudden heart failure on the part of the victim, not to any lack of precaution on the part of the employer, declaring that lead poisoning was caused, not by the breathing of fumes and dust, but by the man's failure to scrub his fingernails. Workmen preferred to trust laymen whose ideas would be more like their own. But the attitude of the medical profession toward occupational diseases has undergone a profound change in the last quarter century and I think that now the decision as to the occupational origin of a given disease might be safely entrusted to physicians.

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SYMPOSIUM ON STERILIZATION*

1 EUGENIC STERILIZATION IN EUROPE

MARIE E. KOPP, PH D

The Eugenic sterilization legislation recently enacted in seven European countries is based upon experience in America and upon findings from surveys and studies in Germany and elsewhere on the hereditary aspects of certain diseases. The compulsory aspect of the European legislation applies usually to physically and mentally defective public charges, who after sterilization operation are permitted to return to community life, while the outward manifestation of hereditary disease brings all persons under the provisions of the law in Germany. The hereditary forms of feeble-mindedness, schizophrasia, manic depressive psychosis, epilepsy, Huntington's chorea, deaf-mutism, blindness, severe bodily malformation and severe alcohol or drug-addiction come under the provisions of the German law.

The Department of Public Health is charged in the name of the commonwealth with the investigation of case and family history, the appointment of the deciding body and the supervision of execution of the provisions of the law. The operative procedures are conservatively limited to a severing, tying or occlusion of the vas deferens or the Fallopian tubes, an operation believed not to interfere with the endocrine balance.

Experience with eugenic sterilization in Europe has been altogether too limited to furnish valid factual data as a basis to discuss the relative merits of voluntary and compulsory sterilization legislation.

* A more complete account of this symposium will be published in a later issue of the *American Journal of Obstetrics and Gynecology*.

2. STERILIZATION FROM THE OBSTETRICIAN'S AND GYNECOLOGIST'S POINT OF VIEW

HENRIAMER P. WATSON

The subject is discussed on the basis of experience at the Sloane Hospital for Women during the past five years.

During this time 172 women were sterilized. In each case sterilization was carried out in conjunction with some other operative procedure; with hysterectomy in 16 per cent; with Cesarean section in 41 per cent, and with plastic gynecological operation in 43 per cent.

The indications for sterilization are presented and the methods generally used described.

Sterilization done along with abdominal hysterectomy in early pregnancy was performed in those patients having complications which rendered any further pregnancy hazardous.

Sterilization with Cesarean section was advised at the time of the first Cesarean; was advised against at the time of the first Cesarean; and the patient was given the option of sterilization at the time of the second Cesarean.

In plastic operative cases sterilization was advised and carried out when it was obvious that subsequent delivery would be impossible without serious effect on the uterus or to the cervix or pelvic floor.

3. OPERATIVE METHODS OF STERILIZATION OF THE FEMALE

ELMER HANCOCK

In this paper, methods of sterilization are discussed and not pathological indications or the social aspects.

The history of attempts goes back for scores of years, and so many methods have been advocated that we must conclude that none is perfect.

The ideal is a temporary one that can be done without invalidizing. Nothing temporary has been at all satisfactory. Dickinson's and Hyatt's office attack in numbers and time have not produced enough evidence of safety and simplicity.

We present a method that has simplicity, a maximum of safety and as much safety as the simplest elective laparotomy

It is a modification of Madlener's ligature and resection, using an *absorbable* ligature at the base of a loop of tube removed from its middle portion. A serous exudate forms, and, after absorption of the catgut, sterility depends upon the peritoneal barrier over the separated tubal ends

4 STERILIZATION BY IRRADIATION

IRA I. KAPLAN

During the past 30 years sterilization by irradiation has become an effective method of treatment. Originally the action of irradiation was thought to be only on the ovaries, today it is known to effect both ovaries and uterine tissues.

X-ray therapy is used in small repeated doses over several weeks and a small quantity of radium inserted in the uterus over a long period of time.

Sterilization may be indicated for conditions grouped as

- A Medical
- B Surgical
- C Gynecological
- D Social

Sterilization follows as a necessity when treating malignancy of the gynecological tract and carcinoma of the breast

A Irradiation is chosen because

- 1 Of absence of mortality or morbidity
- 2 To one qualified, it provides a modality easily employed
- 3 Properly administered irradiation can permanently sterilize

B Irradiation is chosen

- 1 In cardio-renal diseases where surgery is contraindicated
- 2 In tuberculosis patients, where pregnancy is hazardous
- 3 In treating breast malignancy in young women with menstrual function still active

- 4 In menopausal symptoms to hasten menopause
- 5 In endometriosis
- C Methods employed
 - 1 X-Ray
 - 2 Radium
- D Effectiveness of irradiation depends on
 - 1 Age—The younger, the less permanent the sterilization
 - 2 Intensity
 - 3 Physical characteristics
- E Complications and Sequelae

When properly employed irradiation sterilization is of equal worth and effectiveness with surgery without its associated mortality and morbidity

5 STERILIZATION FROM THE STANDPOINT OF THE INTERNIST

JOHN WICKOFF

The interest of the internist in the subject of sterilization is concerned principally with the effect of pregnancy on chronic disease

Successful pregnancies have been reported in chronic leukemia. Anemia of the Addisonian type can be treated. Congenital haemophilia presents a problem due to transmission.

Hypothyroidism is exaggerated by pregnancy. Diabetes is no contra-indication. Maladies of the digestive tract offer little indication.

Renal disease and hypertension are considered from 1) influence of pregnancy on glomerulonephritis and essential hypertension. 2) influence on pregnancy of glomerulonephritis, essential hypertension and previous toxemia. Active glomerulonephritis is a contra-indication to pregnancy, especially when renal function is impaired.

Uncomplicated essential hypertension is rarely a contra-indication to pregnancy, unless complicated by retinal hemorrhage and when before pregnancy the diastolic pressure is high. Myocardial involvement due to coronary disease or previous cerebral accident are contra-indications.

The history of more than one previous toxemia is a contraindication

Heart diseases in pregnancy are mostly of the rheumatic type. Patients with good cardiac reserve do well. Patients with markedly diminished reserve should not become pregnant.

Patients with active tuberculosis are made very much worse by pregnancy.

The physician who advises permanent sterilization takes a serious responsibility. The indications are: 1) Hereditary taint, such as haemophilia, 2) chronic disease in which pregnancy or the additional burdens subsequent to child-bearing have serious deleterious effects upon either mother or child, or both, and in which there is practical certainty that the disease itself is either progressive or that it will never improve.

6 STERILIZATION FROM THE STANDPOINT OF THE NEURO-PSYCHIATRIST

FOSTER KENNEDY

Critical analysis of evolutionary development should be made, to presage any conclusions as to the point of view of the neuro-psychiatrist as to decisions on the subject of Sterilization.

Though manic depressive states are somewhat hereditary, history has nevertheless shown that many have contributed to civilization, by ideas, talents and achievements emanating from their brilliant minds.

Compulsory sterilization for conditions, such as schizophrenia and manic depressive, performed without anyone, as yet, having knowledge of its pathology, and therefore the uncertainty of what to-morrow might bring forth in the way of prognosis, makes this procedure highly questionable as to its righteousness.

Sterilization of the criminally insane is considered desirable.

Sterilization of the feeble-minded, 90 per cent showing hereditary influences, is thought desirable, in fact those at

large as well as those in institutions, so as to eradicate the condition. But difficulty might present itself in labelling and grouping such individuals.

The problem of the perfection of the race is beyond the present knowledge and capacity of man.

7. LEGAL CONSIDERATIONS FOR THE PHYSICIAN

WILLIAM J. McWILLIAMS
Attorney-at-Law

What is the civil and criminal liability of the operating physician who performs a vasectomy or salpingectomy in private practice? Physicians must remember Judge Cardozo's statement applying to all surgery that "a surgeon who performs an operation without his patient's consent commits an assault for which he is liable in damages—except in cases of emergency where the patient was unconscious—" Depending on the circumstances, consent for human sterilization may be given by the patient, or by the patient together with his parents or guardian, or may be imposed by state officials, or may be forbidden by law. Frequently the uterus or ovaries are removed as an incident to curing disorder. This is lawful upon the patient's consent. It is lawful in New York and most states to perform a vasectomy or salpingectomy in private practice on a sane adult for the eugenic purpose of preventing procreation of children likely to be mentally defective. The U. S. Supreme Court in *Buck vs. Bell* held constitutional a Virginia statute compelling sterilization of feeble-minded for the same purpose. Four states have penal statutes that limit sterilization in private practice to cases of "medical necessity." Minors and mental defectives sometimes are capable of joining parents or guardians in giving consent but the risk is on the physician to show comprehension of the consent. Twenty-eight states have laws providing for the compulsory or voluntary sterilization of mentally deficient persons, and under them at least 23,118 operations have been performed.

RECENT ACCESSIONS TO THE LIBRARY

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- American Public Health Association & American Water Works Association
Standard methods for the examination of water and sewage 8 ed
N Y, American Public Health Assoc, 1936, 309 p
- Bargen, J A The management of colitis
N Y, National Medical Book Co, 1935, 234 p
- Berard, L & Peycelon, R Traitement chirurgical de la maladie de Basedow
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Paris, Masson, 1936, 179 p
- Blair, V P & Ivy, R H Essentials of oral surgery 2 ed
St Louis, Mosby, 1936, 606 p
- Bortz, E L A diabetic manual for practitioners and patients
Phil, Davis, 1936, 222 p
- Brickner, R M The intellectual functions of the frontal lobes
N Y, Macmillan, 1936, 354 p
- Brodhead, G L Approaching motherhood 4 ed
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- Carman, J S Rats, plague, and religion
Phil, Judson, [1936], 246 p
- Cole, W H & Elman, R Textbook of general surgery
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- Dennie, C C The gift of Columbus
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- Dietz, (Mrs) L D Professional problems of nurses
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- Dimmitt, (Mrs) P S Manual of clinical laboratory methods 2 ed
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- Dumarest, F, Lefevre, P, Mollard, H [et al] La pratique du pneumo-
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- Ford, J, Morrow, K & Thompson, G N Slums and housing, with special
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- Franquet, R & Ginsbourg, B Abregé de pathologie expérimentale
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- Goodale, R H Interpretation of laboratory findings
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- Hall, M C Control of animal parasites
 Evanston, North American Veterinarian, [1936], 162 p
- Herrmann, L G Passive vascular exercises and the conservative management of obliterative arterial diseases of the extremities
 Phil, Lippincott, [1936], 288 p
- Hertzler, A E Surgical pathology of the thyroid gland
 Phil, Lippincott, [1936], 298 p
- Holmes, S J Human genetics and its social import
 N Y, McGraw-Hill, 1936, 414 p
- Houcke, E La rate en pathologie sanguine
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- Jelliffe, (Mrs) B (Dobson) For dear life
 N Y, Scribner, 1936, 355 p
- Keyes, E L & Ferguson, R S Urology 6 ed
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- Landau, A & Held, J La syphilis gastrique
 Paris, Masson, 1936, 185 p
- Larnaudie, R La vie surhumaine de Samuel Hahnemann
 Paris, Parthenon, [1935], 276 p
- Leblanc, E Synthèse des voies de conduction des centres nerveux
 Paris, Alcan, 1935, 235 p
- Luten, D The clinical use of digitalis
 Springfield, Ill, Thomas, 1936, 226 p
- McBride, E D Disability evaluation
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- MacKee, G M & Cipollaro, A C Skin diseases in children
 N Y, Hoeber, 1936, 345 p
- Malinovskiy, M S & Quater, E Carcinoma of the female genital organs
 Boston, Humphries, [1936], 255 p
- Meakins, J C The practice of medicine
 St Louis, Mosby, 1936, 1343 p
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 Balt, Williams, 1936, 199 p
- Mitchner, P H, Shattock, C E, Slesinger, E G [et al] Surgery for dental students
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- Mondor, H J J Les avortements mortels
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 Paris, Legrand, 1936, 2 v in 1
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 London, Longmans, [1935], 597 p
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- Porak, R La diurese
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- Rolleston, (Sir) H D The endocrine organs in health and disease
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London, Longmans, [1936], 294 p
- Woodall, P H The injection treatment of hernia
Birmingham, Ala, Premier Print Co, [1936], 90 p

PROCEEDINGS OF THE ACADEMY MEETINGS

OCTOBER

STATED MEETINGS

SPECIAL NOTICE

There was no Stated Meeting of the Academy on October 1

The next Stated Meeting (Harvey Society) was that of October 15

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)

October 15

THE FIRST HARVEY LECTURE The Relationship of the Cerebral Cortex to Consciousness
Wilder Penfield, Professor of Neurology McGill University

SECTION OF SURGERY—October 2

- I READING OF THE MINUTES
- II PRESENTATION OF CASES—*a* 1 Postoperative lobar collapse 2 Postoperative abscess of lung Walter T Stenson
- III PAPERS OF THE EVENING—*a* The treatment of intrathoracic tumors William DeWitt Andrus *b* Acute empyema Frank B Berry
- IV GENERAL DISCUSSION
- V EXECUTIVE SESSION

SECTION OF DERMATOLOGY AND SYPHILOLOGY—October 6

- I READING OF THE MINUTES
- II PRESENTATION OF MISCELLANEOUS CASES
- III DISCUSSION OF SELECTED CASES
- IV EXECUTIVE SESSION

SECTION OF PEDIATRICS—October 8

- I PAPERS OF THE EVENING—*a* The prophylactic and therapeutic value of convalescent serums in some of the acute infectious diseases William Thalheimer (by invitation) Discussion opened by Ralph S Muckenfuss (by invitation) and William H Park *b* Syphilis and gonococcal infections in children Charles Walter Clarke Director of Bureau of Social Hygiene Department of Health (by invitation) Discussion opened by John L Rice and Robert R Sellers (by invitation)
- II GENERAL DISCUSSION
- III EXECUTIVE SESSION—Nomination of one member for Advisory Committee to replace Dr Wollstein resigned

SECTION OF NEUROLOGY AND PSYCHIATRY—October 13

- I PRESENTATION OF CASES—*a* A case of poikilothermia with pathological findings Charles Davison Discussion E D Friedman
- II PAPERS OF THE EVENING—*a* Experiments on the pharmacology of muscle tonus Foster Kennedy Alexander Wolf (by invitation) Discussion J A Hunt B Sachs I Strauss Frederick Tilney *b* Concerning the pathology of Parkinsonism (idiopathic arteriosclerotic and post encephalitic) with a report of 15 necropsies M Neustaedter Amour F Liber (by invitation) Discussion K Goldstein (by invitation) James Ramsay Hunt Israel Strauss *c* Some unconscious factors in a case of homicide Philip R Lehrman Discussion Bernard Glueck Hon Frederic Kernochan (by invitation)

SECTION OF GENITO URINARY SURGERY—October 14

- I HYDRONEPHROSIS IN CHILDREN CASE REPORTS James L Bray (by invitation)
- II PAPER OF THE EVENING—Obstructive uropathy in infancy and childhood Elmer Belt Los Angeles (by invitation) Discussion opened by Paul M Butterfield Meredith F Campbell Abraham Hyman Nathaniel P Rathbun Prof Caporelli—Turin Italy (by invitation) Paul Alexander Ferrier—Pasadena (by invitation) Clarence Bandler

SECTION OF ORTHOPEDIC SURGERY—October 16

- I EXECUTIVE SESSION—*a* Reading of the minutes
- II PAPERS OF THE EVENING—*A Symposium on Soft Tissue Tumors of the Extremities*—*a* Tumors of the nervous and vascular structures of the extremities Arthur Purdy Stout *b* Tumors of the muscles fascia and tendons N Chandler Foot *c* Fibroblastic tumors of the extremities Edgar M Bick *d* General discussion to be opened by Paul Klemperer

SECTION OF OPHTHALMOLOGY—October 19

The Section decided to forego its October meeting in favor of the Graduate Fortnight. The program of the Graduate Fortnight for Monday evening, October 19, was arranged by courtesy of the Section.

SECTION OF MEDICINE—October 20

The Section decided to forego its October meeting in favor of the Graduate Fortnight. The program of the Graduate Fortnight for Tuesday evening, October 20, was arranged by courtesy of the Section.

SECTION OF OTOLARYNGOLOGY—October 21

The Section decided to forego its October meeting in favor of the Graduate Fortnight. The program of the Graduate Fortnight for Wednesday evening, October 21, was arranged by courtesy of the Section.

SECTION OF OBSTETRICS AND GYNECOLOGY—October 27

The Section decided to forego its October meeting in favor of the Graduate Fortnight. The program of the Graduate Fortnight for Tuesday evening, October 27, was arranged by courtesy of the Section.

AFFILIATED SOCIETIES

NEW YORK ROENTGEN SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE
October 19

The regular October meeting was not held on account of the meetings of the Graduate Fortnight.

NEW YORK PATHOLOGICAL SOCIETY *in affiliation with* THE NEW YORK ACADEMY OF MEDICINE

There was no meeting of the New York Pathological Society in October, as the Graduate Fortnight of the Academy of Medicine was given during a period including the date of the regular meeting.

NEW YORK MEETING of the SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
October 21

- I Studies on gonadotropic antihormones, H. J. Gegerson, A. R. Clark, R. Kurzrok
- II Experimental production of exophthalmos resembling that found in Graves' disease
G. K. Smelser (Introduced by P. E. Smith)
- III Electrophoretic anesthesia of skin and its application to intradermal testing in hay fever, H. A. Abramson
- IV Positive formol gel reaction associated with hyperglobulinemia in lymphogranuloma in guinea: multiple myeloma and liver cirrhosis, A. B. Gutman, C. R. Wise (Introduced by W. W. Palmer)
- V Cultivation of the virus of the common cold in the chorioallantoic membrane of the chick embryo, Y. Kneeland, Jr., K. C. Mills, A. R. Dochez
- VI Formation of sulfide by some sulfur bacteria, R. L. Starkey
- VII Effect of crystalline vitamin C (ascorbic acid) on tolerance to tuberculin, M. M. Steinbach, S. J. Klein
- VIII Effect of certain drugs on after contraction, M. R. Sapirstein, R. C. Herman, G. B. Wallace

NOVEMBER

STATED MEETING

November 5

- I EXECUTIVE SESSION—*a* Reading of the Minutes *b* Election of Members and Fellow,
c Election of Honorary Fellows *d* Report of Nominating Committee *e* Election of Trustee

- II PAPER OF THE EVENING—Educational Backgrounds for Professional Men William Mather
Lewis President Lafayette College

THE HARVEY SOCIETY (IN AFFILIATION WITH THE NEW YORK ACADEMY OF MEDICINE)
November 19

THE SECOND HARVEY LECTURE The Passage of Fluid Through the Capillary Wall
Eugene M Landis Robinette Foundation University of Pennsylvania

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY—November 4

- I READING OF THE MINUTES
II PRESENTATION OF CASES—*a* Skin and Cancer unit of the Post Graduate Medical School
b Miscellaneous cases
III DISCUSSION OF SELECTED CASES
IV EXECUTIVE SESSION

SECTION OF SURGERY—November 6

- I READING OF THE MINUTES
II PRESENTATION OF CASES—*a* Laceration of median nerve Charles W Lester *b* 1 Massive soft tissue destruction about the left shoulder Complete temporary brachial paralysis from belt and pulley injury Treatment by maintaining the effort position Result 2 Old complete ulnar nerve laceration at wrist X Ray diagnosis—bony tuberculo sis of hand Suture of nerve Result Nelson J Cornell
III PAPERS OF THE EVENING—*a* Subarachnoid injection of alcohol for the relief of pain E Jefferson Browder Brooklyn (by invitation) *b* Acute subdural hematomas and acute epidural hemorrhage Foster Kennedy Herman Wortis (by invitation)
IV GENERAL DISCUSSION
V EXECUTIVE SESSION

COMBINED MEETING OF THE NEW YORK NEUROLOGICAL SOCIETY and
THE SECTION OF NEUROLOGY AND PSYCHIATRY—November 10

- I CASE PRESENTATION—Calcified subpial lesion of the spinal cord with associated varices Clarence C Hare William H Everts (by invitation) Discussion Richard M Brickner Israel S Wechsler Herman Selinsky
II PAPERS OF THE EVENING—*a* The relation between function and vascularity in the nervous system Henry S Dunning Harold G Wolff Lawrence S Kubie Bernard Wortis *b* The emotional factor in skin disorders Eugene Bernstein Discussion Bernard Sachs Smith Ely Jelliffe Abraham A Brill Bernard Wortis John Millet

SECTION OF HISTORICAL AND CULTURAL MEDICINE—November 11

- I READING OF THE MINUTES
II PAPERS OF THE EVENING—*a* Lunar influence on the human William Harris Stahl Ph D (by invitation) *b* On style in medical literature its traditions circumstances diversions lethargies an inquest Walter R Bett (by invitation)
III GENERAL DISCUSSION

SECTION OF PEDIATRICS—November 12

- I PAPER OF THE EVENING—The prevention and treatment of the invalid reaction in childhood Leo Kanner Johns Hopkins Univ School of Medicine (by invitation) Discussion Oskar Diethelm (by invitation) Josephine Kenyon William S Langford (by invitation) John A P Millet Herbert B Wilcox Ira S Wile Rustin MacIntosh
II GENERAL DISCUSSION
III EXECUTIVE SESSION—Election of member of Advisory Committee to succeed Dr Martha Wollstein resigned Nominee Hugh Chaplin—elected

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SECTION OF OPHTHALMOLOGY—November 16

Program Arranged by THE KNAPP MEMORIAL EYE HOSPITAL
 Instructional Hour 7:00-8:00 p.m.—Perimetry Refraction A. H. Thomasson Benjamin
 Friedman

SCIENTIFIC PROGRAM

- I READING OF MINUTES
- II REPORT OF CASES—*a* Chancre of the conjunctiva O. P. Perkins *b* Familial degeneration of the retina leading to detachment Benjamin Friedman *c* Acetylcholine in the treatment of acute retrobulbar neuritis Walter F. Duggan (by invitation) read by Le Grand H. Hardy *d* Unusual complications of a hypermature cataract Arnold Knapp *e* Mixed tumor of the lachrymal gland Joseph Ziporkes *f* Experiences in iridocapsular operations with retention of round pupil Franklin Bracken (by invitation)
- III PAPERS OF THE EVENING—*a* Ocular complications of cerebral aneurysm Samuel C. Burchell Discussion Thomas H. Johnson *b* Activities of the glaucoma clinic at the Knapp Memorial Eye Hospital during the past year Mark J. Schoenberg *c* Demonstration of the new charts recording the history and status of glaucoma patients Benjamin Esterman (by invitation)

COMBINED MEETING OF THE NEW YORK GASTROENTEROLOGICAL ASSOCIATION
 AND THE SECTION OF MEDICINE—November 17

- I READING OF THE MINUTES
- II PAPERS OF THE EVENING—*a* A study of the glycemic response in patients with biliary disease Henry A. Ratsky Discussion Albert F. R. Andresen Mills Sturtevant *b* The diagnosis of surgical jaundice Reuben Ottenberg Ralph Colp Discussion Carl Greene *c* The present status of the typhoid carrier problem Elif C. Hanssen Discussion Samuel Frant (by invitation) Frederic W. Bancroft
- III GENERAL DISCUSSION
- IV EXECUTIVE SESSION

SECTION OF GENITO-URINARY SURGERY—November 18

- I READING OF THE MINUTES
- II PRESENTATION OF INSTRUMENT—The Lowsley Peterson universal endoscope *a* new instrument and its uses Andrew Peterson (by invitation)
- III PAPERS OF THE EVENING—*a* Intraprostatic injection—an experimental study Vincent J. O'Connor Chicago (by invitation) *b* Medical and surgical treatment of chronic prostatitis Louis M. Orr II Orlando Florida (by invitation) Discussion Terry M. Woodend J. Sturdivant Read Joseph F. McCarthy Oswald S. Lowsley Charles Lippert (by invitation) John Morrissey J. S. Ritter
- IV GENERAL DISCUSSION

SECTION OF OTOLARYNGOLOGY—November 18

- I READING OF THE MINUTES
- II PAPERS OF THE EVENING—Basic pathological anatomy and histopathology in otolaryngology Presentations and discussions by aid of lantern slides and micro projector) *a* Andrew A. Egerton *b* Throat John D. Kernan *c* Ear Edmund Prince (by invitation) Discussion opened by Isidore Friesner Lantern Slide *d* James G. Dwyer Marvin Jones Joseph G. Druss Rudolph Kramer *e* M. Law Roentgen findings Effect of radiation Henry A. Barrett (by invitation)

SECTION OF OBSTETRICS AND GYNECOLOGY—November 24
SYMPOSIUM ON STERILIZATION

- I PAPERS OF THE EVENING—*a* Eugenic sterilization in Europe Marie E Kopp Ph D (by invitation) *h* Sterilization from the standpoint of the Obstetrician and Gynecologist Benjamin P Watson *c* Operative methods Eliot Bishop (by invitation) *d* By irradiation Ira I Kaplan *e* From the standpoint of the internist John Wyckoff *f* From the standpoint of the neuro psychiatrist Foster Kennedy *g* Legal considerations for the physician William J McWilliams Esq Counsel for National Committee on Maternal Health (by invitation) Discussion William P Healy Howard C Taylor Jr Alfred C Beck Frederick C Holden

II GENERAL DISCUSSION

AFFILIATED SOCIETIES

THE NEW YORK ROENTGEN SOCIETY—November 16

I PRESENTATION OF CASES OMITTED

- II PAPER OF THE EVENING—Roentgenology of the sinuses and skull—fundamental considerations Irving Schwartz
- III DISCUSSION OPENED BY—Frederick M Law J Swift Hanley (by invitation) Charles Wadsworth Schwartz Cornelius G Dyke

IV EXECUTIVE SESSION

NEW YORK MEETING OF THE SOCIETY FOR EXPERIMENTAL
BIOLOGY AND MEDICINE—November 18

- I Filtration studies on reactive infusion fluids Co Tui K L McCloskey M H Schrifft A L Yates
- II Influence of pathway of infection on pathology of olfactory bulbs in experimental poliomyelitis A B Sabin P K Olitsky
- III Chemical studies in bacterial agglutination III A quantitative theory of bacterial agglutination M Heidelberger E A Kabat
- IV Prevention of atherosclerosis in rabbits I Administration of potassium thiocyanate W M Malisoff (Introduced by D Marine)
- V Factors influencing nembutal anesthesia M C Hrubetz S N Blackberg L B Dotz (Introduced by H B Williams)
- VI A contribution to drug allergy Antipyrine M G Mulinos E Schlessioger
- VII Influence of gonads on exophthalmos in rabbits D Marine S H Rosen

NEW YORK PATHOLOGICAL SOCIETY *in affiliation with*
THE NEW YORK ACADEMY OF MEDICINE—November 19

- I CASE REPORTS—*a* Unusual findings in acute coronary thrombosis *b* Two case of congenital syphilis with unusual histological findings in the myocardium James R Lisa
- II PAPERS OF THE EVENING—*a* The primary complex—initial lesion in childhood type of tuberculosis An historical study B M Fried (by invitation) *b* The pathogenesis of tuberculosis as a systemic disease Wolfgang Grethmann
- III EXECUTIVE SESSION



DEATHS OF FELLOWS OF THE ACADEMY

ARONSON, MOSES, M D, 301 West 108 Street, New York City, graduated in medicine from Zurich University of Switzerland in 1883, elected a Fellow of the Academy October 21, 1889, died December 3, 1936

Dr Aronson was consulting physician to the Bronx Hospital. He was a Fellow of the American Medical Association and a member of the County and State Medical Societies

BICKHAM, WARREN STONE, PHIL M, M D, 1160 Fifth Avenue, New York City, graduated in pharmacy from Tulane University in 1886 and in medicine from the College of Physicians and Surgeons in 1887, elected a Fellow of the Academy May 3, 1900, died December 1, 1936

Dr Bickham was at one time surgeon to the Manhattan State Hospital, instructor of surgery at New York Post-Graduate Medical School and Hospital and assistant instructor of operative surgery at Columbia University. In 1925 the degree of Doctor of Laws was conferred on him by Tulane University

He was a Fellow of the American College of Surgeons and the American Medical Association

Dr Bickham was the author of a number of books on operative surgery

REHLING, MARTIN, M D, 209 East 61 Street, New York City, graduated in medicine from the University of the City of New York Medical College in 1894, elected a Fellow of the Academy April 2, 1914, died December 1, 1936

Dr Rehling was a Fellow of the American College of Surgeons, the American Medical Association and a member of the County and State Medical Societies

SCHAPIRA, SAMUEL WILLIAM, M D, 28 West 75 Street, New York City, graduated in medicine from the University of the City of New York in 1895, elected a Fellow of the Academy February 2, 1911, died November 21, 1936

Dr Schapira was attending surgeon to the People's Hospital and consulting urologist to the Beth Israel, Sea View and Sydenham Hospitals. He was a Fellow of the American Medical Association and a member of the American Urological Association and the County and State Medical Societies

STEIN, ARTHUR, M D, 224 East Jersey Avenue, Elizabeth, New Jersey, graduated in medicine from the Frederick Wilhelm University of Berlin in 1890, elected a Fellow of the Academy on October 1, 1908, died November 28, 1936

Dr Stein was pediatrician to the Elizabeth General and St Elizabeth's Hospitals and consultant to the Rahway Memorial Hospital

He was a member of the American Academy of Pediatrics and a Fellow of the American Medical Association

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